NOTEBOOK COMPUTER

USER'S GUIDE

Notebook Computer

User's Guide

753005

Manual edition 4.0, MAR. 1996 Document Number G7536102

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

Trademarks

Phoenix is a trademark of Phoenix Technologies Ltd; CardSoft is a trademark of SystemSoft Corporation. AutoCAD and Autoshade are trademarks of Autodesk, Inc. IBM, OS/2, and VGA are trademarks of International Business Machines Corp. Lotus, 1-2-3, and Symphony are trademarks of Lotus Development Corp. Windows, Word, MS-DOS, and Microsoft are trademarks of Microsoft Corp. WordPerfect is a trademark of WordPerfect Corp. VESA is a trademark of Video Electronics Standards Association.

Other product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies

Limitation of Liability

While reasonable efforts have been made to ensure the accuracy of this manual, the manufacturer and distributor assume no liability resulting from errors or omissions in this manual, or from the use of the information contained herein.

Contents

Notices

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Shielded interface cables and AC power cord must be used in order to comply with emission limits.

3. This equipment is to be used with power supply: "Asian" type APD-9510-19L or "Ilan" Type F1560P

CANADIAN DOC NOTICE FOR CLASS B COMPUTING DEVICES

This Class B digital apparatus meets all requirements of the Canadian Interference - Causing Equipment Regulations.

Cet appareil numerique de la classe B repecte toutes les exigences du Règlement sur le matèriel brouilleur du Canada.

Safety Precautions

This section is designed to assist you in identifying potentially unsafe conditions while working with this product. Required safety features have been installed in the computer to protect you from injury. However, you should use good judgment to identify potential safety hazards:

- Read all of these instructions before use and save them for later use.
- Follow all warnings and instructions marked on the product.
- Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. To clean, wipe with a damp cloth.
- Do not use this product near water.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings in the cabinet are for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. This product should never be placed near or over a radiator or heater.
- Never push objects of any kind into this product through cabinet slots, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill liquid of any kind on the product.
- This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

- This product is equipped with a 3-wire grounding-type plug. This plug only fits into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your outlet. Do not use an adapter of any kind.
- If you use an extension cord with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
- Adjust only those controls that are covered by the operating instructions, since improper adjustment of other controls may result in damage and may require extensive work by a qualified technician to restore the product to normal operation.
- Do not attempt to service this product yourself, as opening or removing the cabinet may expose you to dangerous voltage or other risks. Refer all servicing to service personnel.
- Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - — If the power cord or plug is damaged or frayed;
  - — If liquid is spilled into the product;
  - — If the product has been exposed to rain or water;
  - — If the product does not operate normally when the operating instructions are followed;
  - — If the product has been dropped or the cabinet has been damaged;
  - — If the product exhibits a distinct change in performance, indicating a need for service.

- Turn off the computer before connecting a peripheral device.
- Replace the battery pack only with the same type as the original. Use of another battery pack may present a risk of fire or explosion.

Warning:	The battery pack may explode if mistreated. Do not disassemble the battery or dispose of it in fire. Keep away from children and dispose of the used battery promptly.

Wichtige Sicherheitshinweise

- Lesen Sie alle Hinweise vollständig durch.
- Bewahrend Sie alle Begleitmaterialien sorgsam auf.
- Folgen Sie allen am Gerät angebrachten Warnungen und Hinweisen!
- Vor dem Reinigen des Netzgeräts Netzstecker ziehen! Keine Flüssigreiniger oder Sprühreiniger verwenden! Zum Reinigen ein angefeuchtetes Tuch benutzen!
- Das Netzgerät nicht in feuchten Räumen verwenden.
- Auf der Oberseite des Gehäuses des Netzgerätes befinden sich Belüftungsöffnungen, die im Sinne der Betriebssicherheit nicht abgedeckt werden sollten.
- Das Netzgerät ist mit einem Schukostecker ausgestattet, welcher einen sicheren Schutzleiteranschluß für das Gerät bietet. Dies ist eine Sicherheitsmaßnahme. Falls der Stecker nicht an die Steckdose paßt, sollte ein Elektriker die Steckdose gegen eine neue austauschen.
- Das Gerät wird durch Abziehen des Netzstecker vom Stromnetz getrennt. Die Steckdose sollte sich daher in der des Geräts befinden und leicht zugänglich sein.
- Der Rechner sollte nur mit dem vom Hersteller angegebenen Netzgerät betrieben werden.
- Ersetzen Sie den Akku nur durch einen baugleichen Typs, sonst besteht Feuer- und Explosionsgefahr! Der Akku sollte nur vom Fachpersonal ausgewechselt werden.
- Dieses Gerät enthält einen Nickel-Kadmium-Akku. Im Interesse des Umweltschutzes bitte nicht mit dem Hausmüll entsorgen. Eine Entsorgung kann je nach nationalen Vorschriften über eine Kundendienststelle oder entsprechende Sammelstellen erfolgen.

Warnung:	Der Akku kann bei falscher Handhabung explodieren! Nicht zerlegen oder in offenes Feuer werfen! Von Kindern fernhalten und nach Gebrauch sofort entsorgen!

About This Manual

This manual contains information to help you get the most from your notebook computer. Whether you are a new or experienced computer user, you will benefit more from this manual if you are familiar with its organization. This manual contains ten chapters, appendices, and an index.

Chapter 1: "Introduction/Features," lists the special features of your notebook computer and available options. It illustrates the components of your notebook and provides information about the computer's operating environment.

Chapter 2: "Getting Started," lists all the parts you should have received and gives you step-by-step procedures for setting up and starting the computer. It also outlines how to use the battery pack.

Read this chapter whether you are new to computers or you are an experienced computer user. If you have used a computer before, the information in this chapter should be enough to let you start using your computer.

Chapter 3: "Using the Notebook Computer," instructs you in using the special features of the notebook computer.

Chapter 4: "Connecting Peripheral Devices," tells you how to connect external devices such as printers and audio equipment to your computer.

Chapter 5: "Running System Setup," tells you how to operate the Setup Utility that is provided in the computer's ROM BIOS.

Chapter 6: "Installation of Optional Drivers," tells you how to install and use the software utilities and drivers that come with your computer, including the Pointing Device (TouchPad) Driver, the PMU (Power Management Utility), the VGA drivers, and the DOS Utility & Drivers.

Chapter 7: "Using PHDISK.EXE," describes using the Suspend to Disk Data File Allocation utility to create the Suspend to Disk data file.

Chapter 8: "Caring for Your Computer," offers tips for taking care of your computer and preventing potential problems.

Chapter 9: "Troubleshooting," suggests ways to locate and solve common problems.

Appendix A: "Hard Disk Drive Types," lists the default hard disk drive parameters that are shipped with the system BIOS.

Appendix B: "Specifications," lists the system specifications, including the electrical, mechanical, operating environment, and software specifications.

In addition to this manual, you will also want to the consult manuals for your operating system and application software.

Manual Conventions

The following conventions are used throughout this manual:

- Bullets (for example, this one) present lists of information or items in a list of alternatives.
- Numbered procedures guide you through sequential steps. The beginning of a procedure is indicated by the ➲ symbol.
- Notes contain important information that is set off from the text.
- Caution messages appear before procedures which, if not observed, could result in loss of data or damage to equipment.

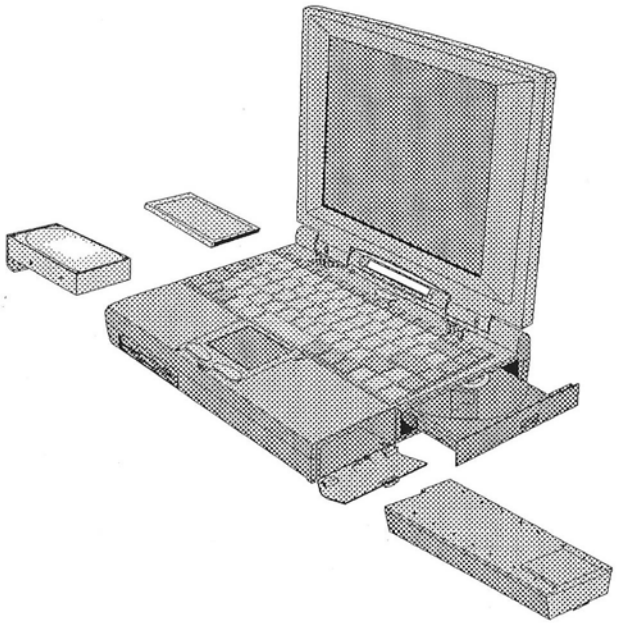
1 Introduction/Features

This chapter introduces the special features of your high-performance color notebook computer.

Your notebook computer is lightweight, compact, and fully compatible with software and hardware products designed for IBM PC/AT and compatible personal computers. The computer is designed for a wide range of personal productivity, multimedia, presentation, and business applications, including memory-intensive applications. With its rechargeable battery pack and high-speed performance, the computer is the ideal choice for use in the office, at home, and on the road.

Best of all, the computer provides extensive upgrade options, including: exchangeable LCD panel, removable hard disk drive, PCMCIA support, optional docking station, MPEG Module, and Memory Expansion Cards.

Figure 1. The notebook computer & upgrade options.



1.1 Features

Your notebook computer includes the following advanced features:

Central Processing Unit:

Your computer will have either an Intel P54C, P54LM, P54CSLM, series CPU. This will give you the power you need not only to run many of today's large applications, but to run them quickly.

System Memory:

With 8MB of on-board RAM and optional 4/8/16 MB DIM Modules (please always use two 5V DIM Modules with the same capacity for

each expansion), you'll be able to fulfill all the demands for memory that even the most power intensive program could want.

Multimedia:

The multimedia applications available for your notebook utilize both the video and audio capabilities. With a SoundBlaster Pro compatible sound card you'll enjoy realistic 16-bit stereo sound for your multimedia presentations, CD-I video CD-ROMs, audio CD-ROMs, and games. The MIDI/GAME port allows you to connect a MIDI synthesizer to your computer to make MIDI music. The port can also be used for an arcade-like joystick to enhance your games. The Composite Video Jack allows you to send video from your computer to a standard TV. For more information on the MIDI/GAME port or the Composite Video port see Chapter 4.

Password Protection:

The password protection feature of your notebook will prevent any unauthorized persons from accessing important files and information on your computer. For more information see Chapter 5.

Intelligent Power Management Control Features:

The Power Saving Modes of your notebook help reduce power consumption so you'll have to recharge the battery less frequently. They also reduce the amount of heat generated by your computer. Your computer has Normal, CPU Power Save, Standby, and Suspend power management modes. For further information see Chapter 5.

AC Adapter:

The AC Adapter has automatic 100-240V line switching which will automatically check the power voltage coming out of the wall and adjusts it to the amount that your computer operates on.

Rechargeable Battery Pack:

Your notebook uses either a 10-cell NiMH or 9-cell Lithium Ion battery which will supply at least 2 hours of continuous operation on

a full charge. With automatic battery recharging it can fully recharges in 2 hours when the computer is off.

The battery pack also has trickle charging to keep battery power full. With auto-switching, your computer automatically charges the pack for you.

For more information on the Battery Pack see Chapter 2.

Weight and Size:

Weight: 7 lbs. (including the battery pack)

Compact size: 299mm x 230mm x 56mm (11.8" x 9" x 2.2")

And More...

Your computer has an extended keyboard base to provide extra support for your wrists while you are typing. It also has a fully licensed Basic Input Output System (BIOS).

Note:	Because the notebook computer is available in different configurations, some of the features mentioned in this manual might not be included on your computer or may differ slightly.

1.2 Getting to Know Your Computer

The SVGA LCD Screen

Your notebook computer is equipped with a replaceable color Liquid Crystal Display (LCD) screen. Depending on your model, you have either an 11.3 inch (287 mm) or a 12.1 inch (307 mm) SVGA LCD non-glare display. These screens can support 18-bit color and 800 x 600 LCD resolution utilizing a PCI BUS. The LCD screen and SVGA display circuitry let you view text and the latest high resolution video images available from today's software in true color. Backlighting

allows you to comfortably view the screen even when ambient lighting is low.

Open the LCD screen by pressing in on the lower half of the button on the front of the computer. While doing this, gently raise the screen.

After opening the screen, you can adjust it to any angle that is comfortable for you.

You can also connect an optional external VGA/SVGA color display monitor to the VGA/SVGA monitor connector, labeled as CRT icon, on the rear panel of the computer. When you have connected an external monitor, the computer lets you simultaneously operate the LCD screen and the external monitor (TFT display panels only).

	LCD	CRT	Both
DSTN	Yes	Yes	No
TFT	Yes	Yes	Yes

For a description of connecting an external monitor, see Chapter 4.

Front View

With the LCD screen open, you will see several features important for operating your notebook computer, including:

- Power Button
- Built-in microphone
- Built-in speakers
- The keyboard
- The TouchPad
- Floppy Disk Drive
- The LCD indicator panel
- Keyboard release latches

Each of these features is briefly described below.

The Power Button

The button located at the top of the keypad is the power on/off button.

The Built-in Microphone

Near the Touch Pad is a small hole. This is the built-in microphone. It was placed in a central location for the best sound and recording effect.

The Built-in Speakers

The internal speakers are located to the left and right of the Power button. These provide true stereo sound.

The Keyboard

Your computer has an 86-key enhanced keyboard which can perform all the same functions that a desktop can. The Embedded numeric keypad allows easier input of numbers. The inverted "T" cursor control key layout makes it easier to type.

The keyboard is the primary method of communicating with the computer. You can use your keyboard to enter text and navigate through a screen display. Since you will be spending a good deal of time at the keyboard, it is a good idea to familiarize yourself with its layout.

For a detailed description of the keyboard, see Chapter 3.

The TouchPad

With the dual button TouchPad you'll be getting an excellent pointing device that is hardware-compatible with the IBM PS/2 mouse and software-compatible with the Microsoft's mouse mode.

The built-in TouchPad substitutes for a two-button mouse: the left TouchPad button is equivalent to the left mouse button; the right TouchPad button is equivalent to the right mouse button.

You can use the TouchPad with Microsoft Windows as well as non-Windows applications.

- To use the TouchPad with Microsoft Windows, set up Windows to use the Microsoft, IBM PS/2 mouse driver, or the attached TouchPad driver.
- To use the TouchPad with a non-Windows application, install the TouchPad driver found on the Software Utilities disk (for a description, refer to Chapter 6).

Floppy Disk Drive

The floppy disk drive is capable of reading and writing 3.5" 1.44MB floppy diskettes. When the floppy disk drive (FDD) is reading from or writing to a disk, the FDD icon on the LCD indicator panel will come on.

The LCD Indicator Panel

The LCD indicator panel, located below the LCD screen, keeps you informed of the computer's operating status.

These icons are described on the next page, from left to right.

Figure 2. LCD Indicator Panel.

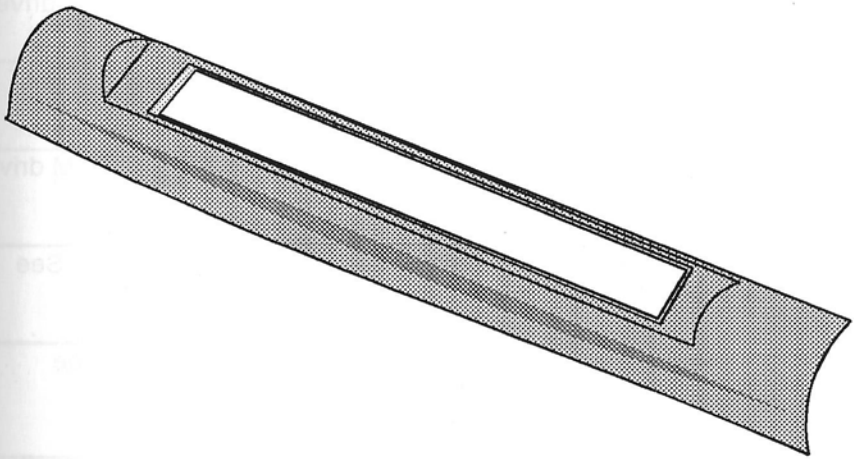


Table 1. LCD indicator panel.

Icon	Description
	Indicates when the computer is plugged in via the AC adapter.
	The battery icon appears whenever the power is turned on and the battery is installed. The number of solid bars shown inside the icon indicates how much charge is in the battery.
	Indicates when any of the Lock functions (i.e.: Caps Lock, Num Lock, Pad Lock, Scroll Lock) is in use.
1	Indicates that the keyboard is in NUM LOCK mode. See Chapter 3 for a description of this mode.
A	Indicates when the keyboard is in Caps Lock mode. In this mode, the keyboard produces uppercase text when you press a key. When you press the Caps Lock key again, the indicator goes off and the keyboard produces lowercase text.
	Indicates when the keyboard is in Scroll Lock mode. Some applications will move information across the screen differently when Scroll Lock is on.
	Indicates that the Pad Lock function is enabled. (simultaneously press the Fn and Num Lock keys to toggle this function on and off). See Chapter 3 for a description of the Pad Lock function and the Fn key.
	Indicates that the computer is accessing the hard disk drive.
	Appears when the computer is accessing the floppy disk drive. See Chapter 3 for using Floppy Diskettes.
	Appears when the computer is accessing the CD-ROM drive. See Chapter 3 for using compact discs.
	Indicates when the computer is accessing a PC card. See Chapter 3 for a description of using PC cards.
	Indicates when the computer is in Suspend mode. See Chapter 5 for a description of this mode.

The Keyboard Release Latches

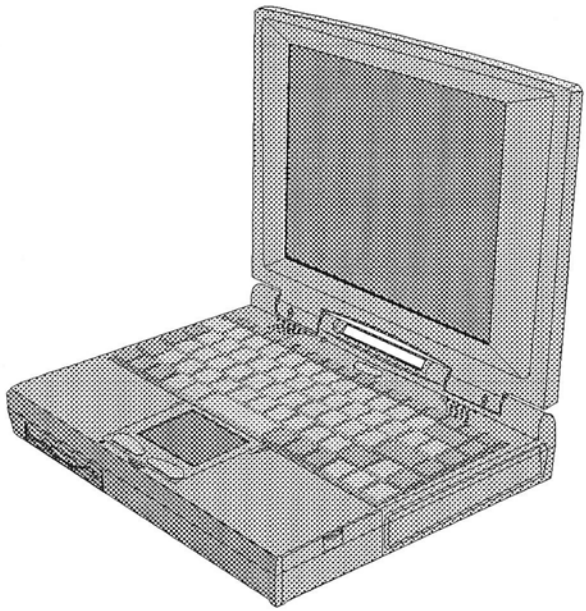
Just below the speakers are the keyboard release latches. These allow you to remove the keyboard and access some of the internal circuitry of your notebook. It is recommended that only a authorized technician remove the keyboard.

Warning:	Before removing the keyboard be sure to discharge all static electricity. Failure to do so may result in permanent damage to your computer that could render it inoperable.

Right Side View

The CD-ROM drive and the battery pack compartment are located on the right side of the computer.

Figure 3. The right side view.



The CD-ROM Drive

Your notebook will come with a 4X TEAC 5.25" CD-ROM drive. You'll be able to reference vast amounts of information effortlessly, take advantage of Multimedia programs, watch video CD's, and be able to listen to your favorite audio compact discs while working with other applications.

For a complete description on inserting/removing a CD-ROM, see Chapter 3.

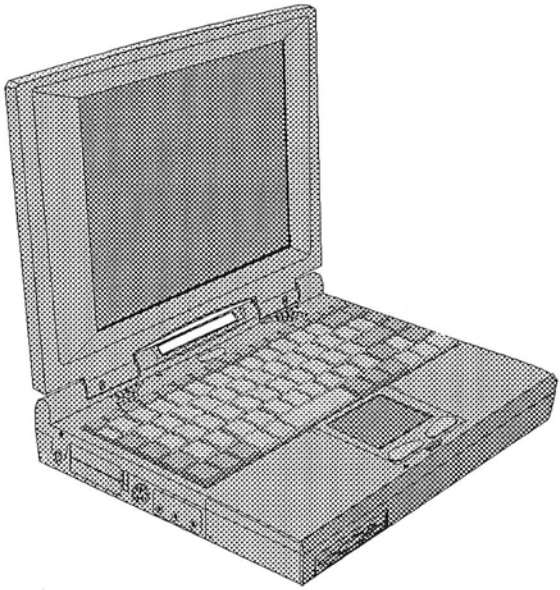
The Battery Pack Compartment

The computer's battery pack is installed in this compartment. For a description of removing/inserting the battery pack, see Chapter 2.

Left Side View

The left side of the computer contains the following features: composite video output port, the PCMCIA sockets, the external keyboard connector, audio in/out jacks, and the removable hard disk drive.

Figure 4. The left side view.



The Composite Video Output Port

The computer's composite video output port let's you use a standard television to export video files from your computer. It's no longer necessary to have a video monitor available, a television with a video input jack will do. The port supports most international television standards. For more information on the Composite Video Output Port please refer to Chapter 2.

The PCMCIA Sockets

The computer's PCMCIA sockets let you extend the capabilities of your computer by inserting PC cards. They also let you do it conveniently, when changing cards there is no need to reboot your computer. There are a wide variety of PC cards available, including: data storage, fax/modem, Local Area Network (LAN), wireless communication cards, and more.

The computer has two PCMCIA connectors (one PCMCIA type II connector and one PCMCIA type III connector). The upper socket is PCMCIA socket "0"; the lower socket is socket "1". The upper ejection button is for socket "0"; the lower button is for socket "1".

For a detailed description of using PC cards, see Chapter 3.

The External Keyboard Connector

Do you prefer to type on a standard keyboard when you can? If so, you can connect an external keyboard, numeric keypad, or IBM PS/2 compatible mouse into this socket.

This connector only accepts an external keyboard with a 6-pin (PS/2-compatible) connector. To connect a keyboard with a 5-pin connector, use a 5-pin to 6-pin transfer cable (available from your dealer).

Note:	You can operate both the internal keyboard and an external keyboard at the same time.

You can also connect an external IBM PS/2 compatible mouse into this socket.

Note:	You can plug in or unplug the PS/2 compatible mouse at any time. It can work with the Notebook PC's Touch Pad simultaneously.

Audio In/Out Jacks

Just to the right of the external keyboard connector are three 1/8" (3.5mm) audio jacks. These are for microphone input, auxiliary input, and speaker output. They are labeled accordingly. These three plugs allow you all kinds of options for listening to and recording your audio sources. You can plug external speakers or headphones into the speaker output jack. The auxiliary input can

be used to connect an external audio source (cassette player, compact disc player, etc.) to your notebook. With the proper software you will be able to record off of this input signal. For more information on using the jacks see Chapter 4.

Removable Hard Disk Drive

Your computer includes a removable 2.5-inch IDE hard disk drive (19mm in height) with at least 340MB and up to 1.2 GB storage capability. By being removable it allows you greater flexibility with what you want to use your computer for. The Notebook PC's BIOS can automatically detect IDE drive types.

For a description of replacing the hard disk drive, see Chapter 3.

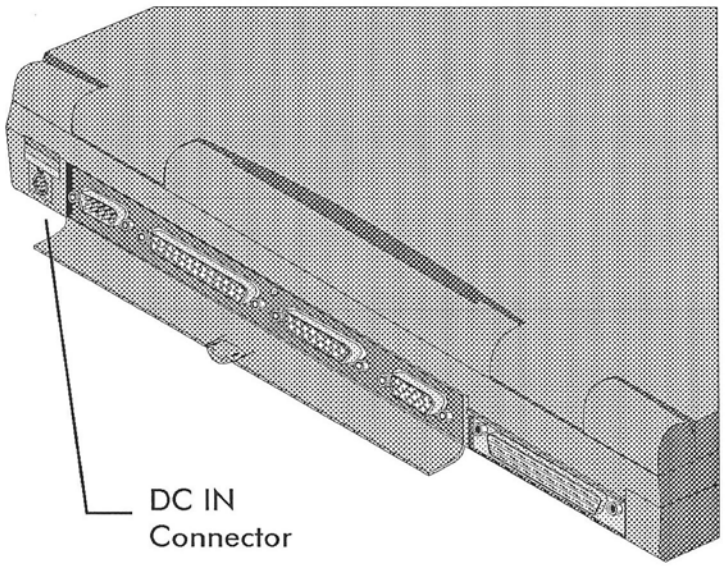
Rear Panel View

The rear panel of the computer contains the following features:

- Docking Station connector
- The external VGA/SVGA port
- The MIDI/GAME port
- The parallel port (printer port)
- The serial port (RS-232)
- The infrared (IR) data transfer port
- The DC IN connector

Each of these features is briefly described on the following pages.

Figure 5. The rear panel view.



The Docking Station Connector

To open the panel for the Docking Station Connector, gently press in the top center part of the cover. While doing this, lift the up the bottom of the panel. The panel should move easily to reveal the 300 pin connector. If you have the optional Docking Station, this is where you would connect the notebook to the station.

The External VGA/SVGA Port

This port allows you to easily connect an external VGA/SVGA display monitor into your notebook using the 15-pin female connector.

The MIDI/GAME Port

This port allows you to easily connect a MIDI Synthesizer or Game joystick to your computer. (An adapter may be necessary for the MIDI synthesizer, please check with your dealer.)

The Parallel Port

This port allows you to easily connect a parallel printer or plotter using this 25-pin bi-directional female port.

The RS-232 Port

With the 9-pin High Speed Serial Port your connections to the Internet or Web will be vastly improved. The port can also be used for a serial printer, mouse, modem, or other serial device.

The Infra Red Data Port

The Infra Red Data Port allows your notebook to truly become wireless. You can use this port to transfer large amounts of data very quickly to any other machine (notebooks, printers, etc.) which is also equipped with an IRDA-compliant IR port. This allows you to print documents without any messy cable hook-ups.

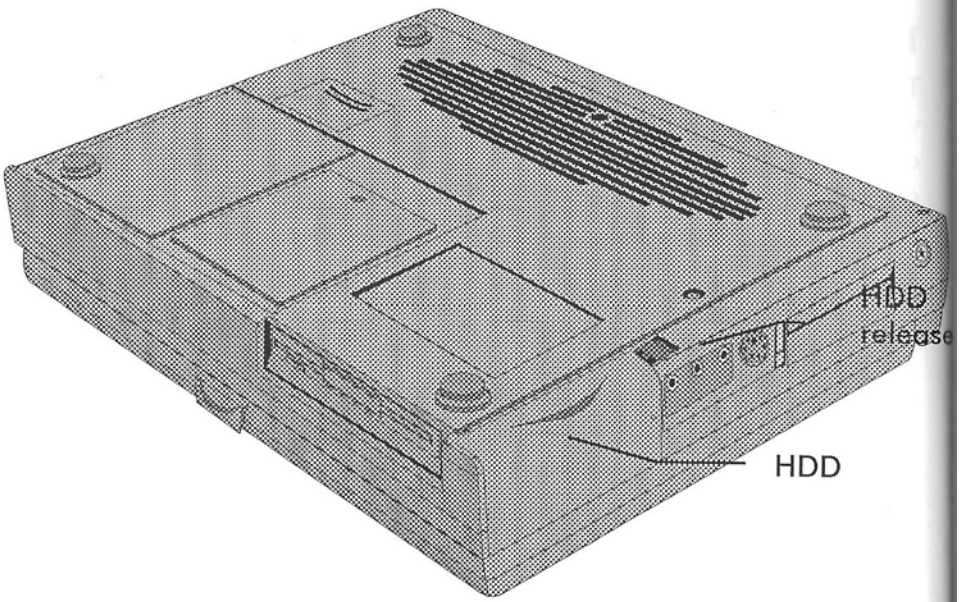
The DC IN Connector

Plug the AC adapter into this connector.

Bottom View

The release switch for the removable hard disk drive is located on the bottom of your computer.

Figure 6. The bottom view.



2 Getting Started

This chapter lists all the items that should be included with your notebook, standard and optional. It also guides you in getting your notebook computer up and running. Lastly, it explains how to use battery power.

2.1 Unpacking

Your notebook computer comes securely packaged in a sturdy cardboard shipping carton. Upon receiving your computer, open the carton and carefully remove the contents.

After unpacking, carefully inspect each component to make sure that nothing is damaged. If any of the materials are damaged, contact the dealer from whom you purchased your computer.

Save the shipping materials and carton in case you want to ship or store the computer in the future. You should also keep your sales receipt for warranty verification in case you need to have your computer serviced.

What You Have

In addition to this *User's Guide*, the notebook computer's shipping carton should include the following items:

- The notebook computer
- A battery pack
- The AC adapter
- A power cord
- A carrying bag
- Software Utility disks

Options

Optional items:

- Docking station
- Hardware MPEG Module
- PCMCIA cards (type II or type III)
- Expansion RAM
- Spare battery pack
- External battery charger

2.2 Operating Environment

You can use your computer under a wide range of environmental conditions. However, to ensure long use and continued high performance, consider the following factors when setting up your computer:

- Set the computer on a flat, stable surface. To prevent damage to the computer's hard disk drive, avoid using the computer where it will be exposed to strong vibration.
- Locate the computer away from electromagnetic or radio frequency interference (for example, television/stereo sets, copying machines, and air conditioners).
- Avoid using or storing the computer where it will be exposed to extreme temperatures. In particular, do not leave the computer in direct sunlight, over a radiator, or near a heat register for a long period of time. High temperature tends to damage the electronic circuitry.
- Avoid using or storing the computer where it will be exposed to high or low humidity. Extreme humidity can contribute to disk drive failure.
- If you are using the computer with the AC adapter, do not allow anything to rest on the power cord. Do not place the computer where people can step on or trip over the cord.

- The openings on the computer are provided to protect the computer from overheating. To ensure reliable operation, leave about 10 cm (4 inches) around the computer for air circulation.
- Avoid placing the computer where there will be dust or smoke in the air.

2.3 Connecting to a Power Source

You can use the provided AC adapter to supply your computer with power from an AC wall outlet. Your computer also comes with a rechargeable battery pack that lets you use the computer without an external power source.

Connecting the AC Adapter

Use the provided AC adapter to supply your computer with power from an AC wall outlet. You can also use the AC adapter to charge the computer's battery pack (for more information on charging the battery pack, refer to "Charging the Battery Pack" later in this chapter).

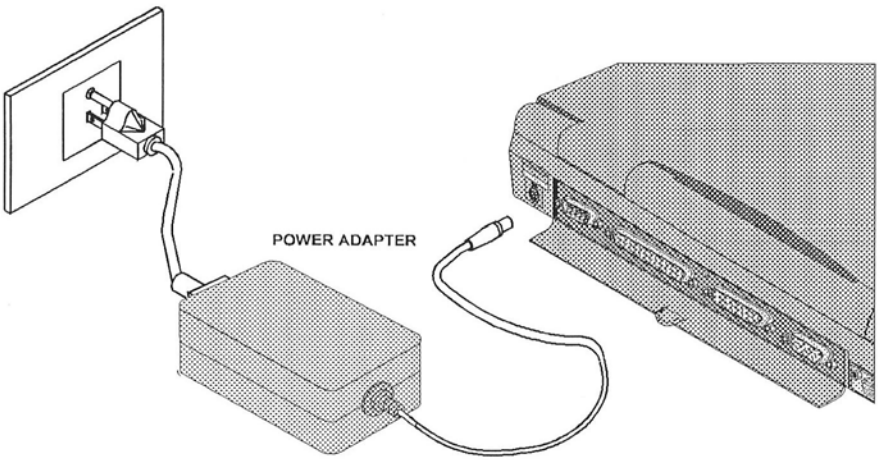
The AC adapter converts high-level AC voltage to the much lower level DC voltage appropriate for the computer. The adapter's AC input voltage can range anywhere from 100 to 240 volts, covering the standard voltages available in almost every country.

The power cord for the AC adapter requires a three-hole grounded AC outlet. An optional four-or six-plug power strip is a convenient addition, especially if you have only one wall plug and several devices that need electricity. You can buy power strips with built-in electrical surge protection. This provides limited protection from glitches in the local voltage that can cause loss of data.

To connect the computer to an external power source:

1. Place the computer so that you have access to its rear panel.
2. Plug the AC adapter's connector into the DC IN connector on the rear panel of the computer.
3. Connect the power cord to the AC adapter and then to a wall outlet. When the AC adapter is receiving power, the power indicator light on the adapter will be on.

Figure 7. Connecting the AC adapter.



Warning:	Use only the AC adapter supplied with the computer. Using the computer with any other adapter may damage the computer.

2.4 Turning on Your Notebook Computer

Before turning on your computer, make sure your familiar with its features (Chapter 1). The following section shows you how to turn on your computer and how to adjust the contrast and the brightness of the screen.

Turning on your Notebook Computer

Now that your notebook is opened and connected to a power source, it's time to turn it on. This is done by pressing the power button located directly underneath the LCD screen in the center of the computer. Hold the button down for a second or two and release. The Power icon will light and the Power-On Self Test (POST) will run automatically (for a description of the Power-On Self Test, see Chapter 10, "Troubleshooting"). After the test runs successfully, you should hear a single short beep.

After the POST is completed, the computer reads the operating system from the hard disk drive into computer memory (this is commonly referred to as *booting* a computer) and the operating system prompt appears.

That's all there is to it. After you boot the computer, you may be prompted to enter the current date and time. Unless you wish to change the computer's internal clock settings, ignore these prompts by pressing the Enter key.

You are now ready to run software programs and use devices such as printers, disk drives, and CD-ROM.

About System Setup

After you turn on the computer for the first time, you will need to run System Setup (for a detailed description, see Chapter 5).

The System is a ROM (Read Only Memory)-based software utility that displays the system's configuration status and provides you with a tool to set system parameters. These parameters are stored in non-volatile battery-backed CMOS RAM which saves this information even when the power is turned off. Whenever the system is turned on, the system is configured with the values found in CMOS memory.

About the ROM BIOS

Your notebook computer is configured with a customized Basic Input/Output System (BIOS), which is a set of permanently recorded program routines that give the computer its fundamental operational characteristics. The BIOS also tests the computer and determines how the computer reacts to specific instructions that are part of programs.

The BIOS is made up of code and programs that control the major input/output devices in the computer. It also contains a set of routines (called POST, for Power-On Self Test) that check out the computer when you turn it on.

About the Power-On Self Test

The Power-On Self Test (POST) runs every time you turn on the computer. The POST checks memory, the main system board, the display, the keyboard, the disk drives, and other installed options.

A few seconds after you turn on your computer, a copyright message appears on your display screen. A memory test message will appear next. As the test continues, memory size increases until all installed

memory is tested. Normally, the only test routine visible on the screen will be the memory test.

Two classifications of malfunctions can be detected during the POST:

- Error messages that indicate a failure with either the hardware, the software, or the *Basic Input/Output System* (BIOS). These *critical malfunctions* prevent the computer from operating at all or could cause incorrect results. An example of a critical error is microprocessor malfunction.
- Information messages that furnish important information on the power-on and boot processes such as memory status. These *non-critical malfunctions* are those that cause incorrect results that may not be readily apparent. An example of a non-critical error would be a memory chip failure.

In general, if the POST detects a system board failure (a critical error), the computer halts and generates a series of beeps. If failure is detected in an area other than the system board (such as the display, keyboard, or an adapter card) an error message is displayed on the screen and testing is stopped. It is important to remember that the POST does not test all areas of the computer, but only those that allow it to be operational enough to run any diagnostic program.

If your system does not successfully complete the POST, but displays a blank screen, emits a series of beeps, or displays an error code, consult your dealer.

Adjusting Contrast and Brightness

After turning on your computer, you may want to adjust the contrast and/or brightness of the LCD screen.

To adjust the brightness on the LCD screen, press and hold down the blue <Fn> key in the lower left hand corner of the keyboard and press the <F1> key to reduce the brightness or <F2> to increase

the brightness. When the desired brightness is achieved, release both keys.

To adjust the contrast on the LCD screen, press and hold down the blue <Fn> key in the lower left hand corner of the keyboard and press the <F3> key to reduce the contrast or <F4> to increase the contrast. When the desired contrast is achieved, release both keys.

2.5 Operating on Battery Power

Your computer comes with a rechargeable battery pack that lets you operate the computer without an external power source. When the battery pack is fully charged, you can operate the computer for approximately 2.0 hours under the following conditions:

- The battery pack initially has a full charge.
- No peripheral devices are installed.
- The disk/CD-ROM drives run no more than 10% of the time.

Note:	Only use batteries that are approved by an authorized dealer. All batteries are not the same and therefore should not be treated as such. Using the wrong battery could cause serious damage to your computer and yourself through toxic emissions.

Installing and Removing the Battery Pack

Before you can use the battery pack, you must install it in the compartment on the right side of the computer.

To install the battery pack:

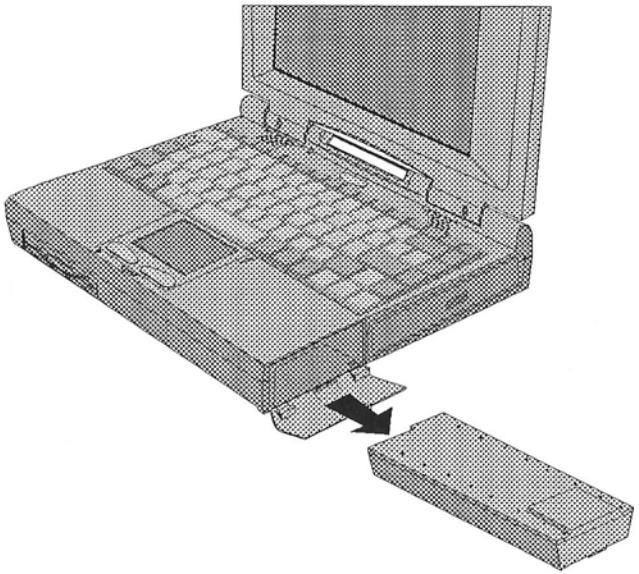
1. Turn off the computer.
2. Locate the battery pack release lever on the right side of the computer.
3. With your thumb, push down gently on the release lever and open the door.
4. Slide the battery into the empty compartment. You can't put it in wrong because it is designed so that it only fits one way.
5. The door will start to close once the battery is almost fully in place. At this point close the door. The release lever will click into place when this is done.

To remove the battery pack:

1. Turn off the computer.
2. Locate the battery pack release lever on the right side of the computer (see Figure 8).
3. With your thumb, push down gently on the release lever and open the door. When the door is completely open the battery should be protrude a little bit from the compartment.
4. Now pull the remaining part of the battery out of the compartment.

The following figure shows removal of the battery pack from its compartment.

Figure 8. Removing the battery pack.



Charging the Battery Pack

The installed battery pack charges automatically anytime the computer is connected to the AC adapter and an external power source. The battery pack can be fully charged in about 2.0 hours when the computer is turned off.

When charging the battery while the computer is on, the LCD indicator panel will show the AC plug blinking. When the battery pack is fully charged, the AC plug icon will be solid.

Note:	It is a good idea to occasionally discharge the battery pack fully to preserve its operating performance. For details, see the section "Batteries & Battery Discharge" in Chapter 9.

3 Using the Notebook Computer

This chapter instructs you in using the special features of the notebook computer, including:

- The keyboard
- The TouchPad
- Power Saving modes

It also tells you how to remove or replace the hard disk drive, CD-ROMs, Floppy Diskettes, and PCMCIA cards.

3.1 Getting to Know the Keyboard

In getting to know your keyboard, it helps to see the keyboard as divided into functional sections:

- The alphanumeric keys
- The cursor keys
- The function keys
- The internal numeric keypad
- The Fn keys
- Special application keys

The Alphanumeric Keys

Most of the keys on the keyboard behave no differently than the keys of an ordinary typewriter (except that the keys on the computer keyboard repeat when you hold them down). As you would expect, these keys are used to enter alphanumeric characters. Use them to type characters, including numbers and symbols such as ~ and =.

In addition, some keys on the keyboard are used in combination with alphanumeric keys to produce different characters. Other keys

perform more specific actions, depending on how the operating system and your application program are designed to use them. To learn more about how special keys work within specific applications, see the manual that came with the application.

Table 2. Typewriter keys.

Key	Function
Backspace	Deletes characters as it moves the cursor to the left. Use it to correct typing mistakes.
Caps Lock	When this key is engaged, letter keys produce uppercase letters (number and symbol keys aren't affected).
Enter	This key can be used in two ways: • At the operating system level and in many application programs, it executes a command. • In text processing programs, use it like a typewriter carriage return key: this moves the cursor to the start of a new line. Refer to the user's manual for the program you are using.
Shift	When you hold this key down, character keys produce upper case letters (or the upper left character on keys with multiple characters). This key also performs some special functions when pressed in combination with other keys.
Spacebar	Moves the cursor to the right, inserting a space character. To move the cursor without inserting or deleting any characters, use the arrow keys.
Tab	Moves the insertion point horizontally to the next stopping place (tab stop).

The Internal Numeric Keypad

The keyboard's internal numeric keypad consists of the 16 alphanumeric keys that have characters printed in blue. The function of this keypad depends on the status of the Pad Lock function

(simultaneously press the Fn and Num Lock keys to toggle this function on/off), Num Lock mode, and the Fn key:

- When the Pad Lock function is on (the PAD icon will light) and Num Lock mode is off, the internal numeric keypad acts like the cursor keys on a standard numeric keypad.
- When the Pad Lock function and Num Lock mode are both on (the PAD and NUM icons will appear), the internal numeric keypad acts like numeric keys on a standard numeric keypad.

When the Pad Lock function is on and you want to type one or more character keys in the internal numeric keypad, press and hold the Fn key while typing a keypad key. When you release the Fn key, you can continue using the keypad keys with their cursor or numeric function.

The Cursor Keys

The four direction (arrow) keys control the movement of the cursor on the screen. They do not affect the displayed characters.

The Function Keys

The keys in the top row of the keyboard labeled F1 through F12 are called the *function keys*. To determine the function of these keys for an application, refer to the user's guide for that application.

You can also press function keys in conjunction with the Fn key to perform special operations (see the description in the section "Using Hot Keys" below).

The Fn Key

You can press the Fn key in conjunction with function keys to perform special operations (see the description in the section "Using Hot Keys" below). Simultaneously pressing the Fn key and the Num Lock key

toggles the Pad Lock function on and off (see the description of this function in the section "The Internal Numeric Keypad" above).

Special Application Keys

The keyboard has a number of special keys whose use varies with the application software you are using (see your application program manual for details). For many applications, these keys have the following functions:

Table 3. Special application keys.

Key	Function
Alt	Works in conjunction with other keys to perform various commands or functions. Refer to the user's manual for the program you are using. To use an Alt key combination, hold down the Alt key and press the other key.
Ctrl	Works in combination with other keys to provide shortcuts or to modify other actions. Different applications use the Ctrl key in different ways. • In many programs, the Ctrl-C combination performs a break or program interrupt. • In many programs, the Ctrl-S combination halts scrolling and lets you view the display. Press the spacebar to continue scrolling. To use a Ctrl key combination, hold down the Ctrl key and press the other key.
Esc	Press this key to cancel or escape from a command or function.
PrtSc SysRq	Pressing this key sends the information currently showing on the display to a connected printer. Pressing this key in conjunction with the Ctrl key sends all output to a connected printer. Press this key combination again to stop the function.
Scroll Lock	In some applications, information will move across the screen differently when this key is engaged.

Key	Function
Pause Break	Pressing this key temporarily halts a running program. To continue using the program again, press any key. Pressing the Pause key in conjunction with the Ctrl key breaks the program.
Ins	Places the keyboard into the *insert mode*. While in the insert mode, data entries are made at the current cursor position and all data to the right of the cursor position moves to the right. The keyboard stays in the insert mode until you press the Ins key again.
Del	Deletes the character to the right of the cursor. All remaining characters to the right of the deleted position move one space to the left.
Home	Moves the cursor to the first character position on the top line of the screen.
End	Moves the cursor to the last character position on the bottom line of the screen.
PgUp	If this key is operable in the application program you are using, it lets you scroll to the previous page.
PgDn	If this key is operable in the application program you are using, it lets you scroll to the next page.

3.2 Using Hot Keys

The computer offers hot key commands that provide easy access to system features.

Table 4. Hot keys.

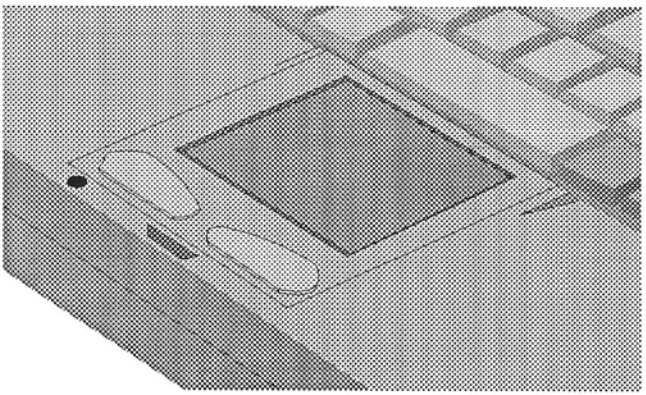
Hot Keys	Description
<F2>	Enter the System Setup menu (during POST).
<Fn+F1>	Reduce LCD brightness.
<Fn+F2>	Increase LCD brightness.
<Fn+F3>	Reduce LCD contrast.
<Fn+F4>	Increase LCD contrast.
<Fn+F5>	Toggle speaker high/low/off.
<Fn+F6>	Reduce the sound volume.
<Fn+F7>	Increase the sound volume.

Hot Keys	Description
<Fn+F8>	Suspend the system.
<Fn+F12>	Switch the display between LCD/CRT.

3.3 Using the TouchPad

The built-in TouchPad is a convenient substitute for a mouse. Its function is similar to that of a two-button mouse: the left TouchPad button is equivalent to the left mouse button; the right TouchPad button is equivalent to the right mouse button.

Figure 9. The TouchPad.



Use the TouchPad as follows:

- To move the cursor, place your thumb or finger on the TouchPad's surface, and move it in the direction you wish the cursor to go.
- To click, press the TouchPad's left or right button or tap the Touch-Pad lightly. To double-click, press either the button or tap the Touch Pad twice in quick succession.

- To drag, move the cursor to the desired location then press down the left button. While still holding down left button, move the cursor to the desired location. Then release the button.

Installing a TouchPad Driver

The TouchPad is internally connected to the computer's PS/2 port. As with a mouse, the TouchPad must be enabled and configured in order to function correctly with your software.

- To use the TouchPad with Microsoft Windows, set up Windows to use the Microsoft, IBM PS/2 mouse driver, or the attached TouchPad driver (for a description, refer to Chapter 5).
- To use the TouchPad with a non-Windows application, run the TouchPad driver found on the Software Utilities disk (for a description, refer to Chapter 5).

3.4 Using PC Cards

The computer's PCMCIA sockets let you extend the capabilities of your computer by adding PC (PCMCIA) cards. There are a wide variety of PC cards available, including: expanded memory, data storage, fax/modem, Local Area Network (LAN), and wireless communication cards.

The PCMCIA (Personal Computer Memory Card International Association) interface specification has standardized the electrical, mechanical, and functional interfaces for PC cards. The computer has two PCMCIA-compatible sockets (each socket is a 68-pin connector), so you can use it with one or two PC cards.

You can use either a type II or type III PC cards with your computer: type II and type III PC cards are 5mm, and 10.5mm thick,

respectively. The computer's PCMCIA sockets accept the following combinations of PC cards:

Card Type	Number of Cards
II	1 or 2
II & III	1 of each
III	1

Configuring a PC Card

Before you can use a PC card, it must be configured with a specific software driver. Refer to Chapter 5 for a list of provided software drivers.

Inserting and Removing PC Cards

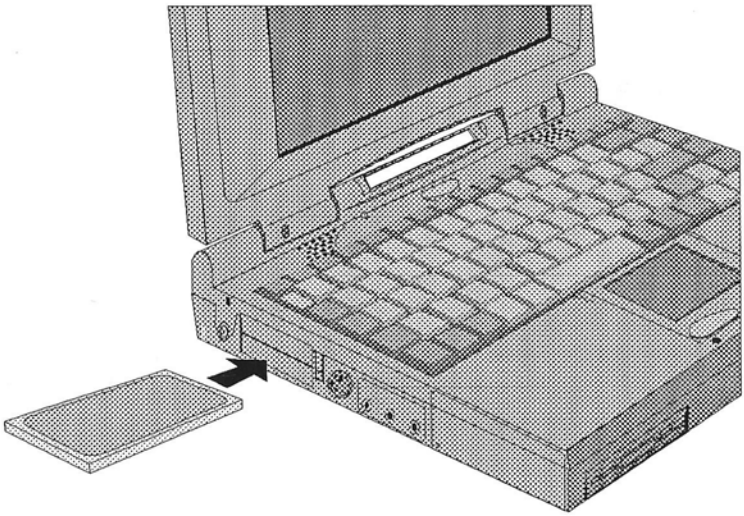
This section describes inserting a PC card into a socket and removing a card. In addition, it discusses drive designations for ATA hard disk cards, Flash RAM memory cards, and SRAM memory cards.

Note: Before you can use your PC card drive, you must install the PCMCIA driver software. For detailed instructions, refer to the PCMCIA Driver User's Guide.

The computer will emit a medium tone followed by a high tone when a PC card is inserted. When you eject a card, the computer will emit a high tone followed by a medium tone. You can insert and remove a PC card whether the computer is turned on or off.

The upper socket is PCMCIA socket "0"; the lower socket is socket "1". The upper ejection button is for socket "0"; the lower button is for socket "1".

Figure 10. Inserting a PC Card.



Insert a PC card into a drive socket as follows:

1. Put the socket end of the card (most cards have an arrow to indicate the socket end) into the drive socket.
2. Push the card firmly until it is fully inserted in the drive (the drive button will pop out).
3. The system will beep twice to indicate that it has detected the PC card. In addition, the drive's icon will flash.

To remove a card from a socket, push the drive button and then grasp the card and pull it out.

3.5 About Power Saving Modes

The computer offers two different levels of power savings control: system level management and device level power management.

- System level power management controls power to the entire system, including the internal clocks, CPU, and peripheral devices.
- Device level power management controls power to peripheral devices only.

Both system level and device level power management functionality can be controlled by adjusting the settings in the Power Menu in System Setup. You can either keep the default settings ("Maximum Performance" or "Maximum Savings") or set your own power management parameters ("Customize").

In addition to the normal operating mode, the computer provides the following power management modes: Idle, Standby, and Suspend.

These modes let you conserve power by temporarily shutting down certain computer subsystems. The table below summarizes power management functions for each mode.

Mode	CPU	DRAM	LCD	HDD	COM	LPT
Normal	high	on	on	on	on	on
Idle	low	on	on	on	on	on
Standby	low	on	off	off	on	on
Suspend	Static	on	off	off	off	off

Each of these modes is described in greater detail below.

Normal Mode

In normal mode, all system clocks are running at full speed and all peripheral devices have power.

Idle Mode

In Idle mode, the CPU clock and some other clocks are reduced in frequency, this mode is also called the "CPU Power Save Mode".

If you set the Idle Mode time-out value with System Setup, the computer will automatically enter Idle mode after a specified period of time during which there is no system activity.

From Idle mode, the computer returns to normal mode when there is input to or output from the computer (including display, keyboard, TouchPad, mouse, serial port, parallel port, PCMCIA socket, or hard disk drive activity).

Standby Mode

In Standby mode, the CPU clock and some other clocks are reduced in frequency. The LCD consumes very little power and the hard disk drive is powered down.

If you set the Standby Mode time-out value with System Setup and there is no system activity while the computer is in Idle mode, the computer will automatically enter Standby mode after the specified length of time.

From Standby mode, the computer returns to normal mode when there is input to or output from the computer (including keyboard, TouchPad, mouse, serial port, parallel port, PCMCIA socket, or hard disk drive activity).

Suspend Mode

Suspend mode is similar to Standby mode except that in Suspend mode most system components are turned off, including the CPU, the LCD, and the hard disk drive. From Suspend mode, the computer returns to normal operating mode when you press any key. If your computer is connected to an optional external fax modem and you have enabled the Resume on Modem Ring feature with

System Setup, the computer also returns to normal operating mode when a call comes in on the telephone line.

To enter Suspend mode press the computer's Suspend hot keys <Fn + F8>. The computer beeps, the LCD screen shuts off, and the Suspend icon goes on.

From Suspend mode, the computer returns to normal operating mode when you press any key. If your computer is connected to an optional external fax modem and you have enabled the Resume on Modem Ring feature with System Setup, the computer also returns to normal operating mode when a call comes in on the telephone line.

If there is no system activity while the computer is in Standby mode, the computer will automatically enter Suspend mode after a length of time that you specify with System Setup (the Auto Suspend time-out option).

Note: The ROM address remapping features supported by QEMM (Stealth parameter ST:F ST:M) or 386MAX (VGASWAP) conflict with the ROM usage of the Power Management BIOS in the Notebook and may cause fatal error. You should disable the ROM address remapping feature , if you want to use memory manager like QEMM or 386MAX.

3.6 Replacing the Hard Disk Drive

Your notebook computer comes with a removable hard disk drive. You can replace the hard disk with another if necessary.

A hard disk drive is a collection of solid spinning platters that are permanently sealed into a dirt-free storage unit. Like a floppy disk, a hard disk drive stores information magnetically. However, your computer can find data stored on a hard disk more quickly than data kept on a floppy disk. A hard disk can also hold more data.

Your hard disk gives you access to all of your files, speeds up computer operation, and makes "disk full" errors a lot less common. Because of the higher capacity and faster access speed, you probably will want to keep the files of the operating system, software applications, and data files on your hard disk. You may then use floppy disks primarily for storing backup copies of programs and files.

A hard disk is more reliable than a floppy disk, since it runs in a sealed, dust-proof case. But like floppy disks, hard disks can fail occasionally, and their data is no safer against accidental change or erasure than data on floppy disks. When you store application programs and data files on your hard disk, make sure that you also have a backup copy. Check your operating system manual for information on backing up your hard disk.

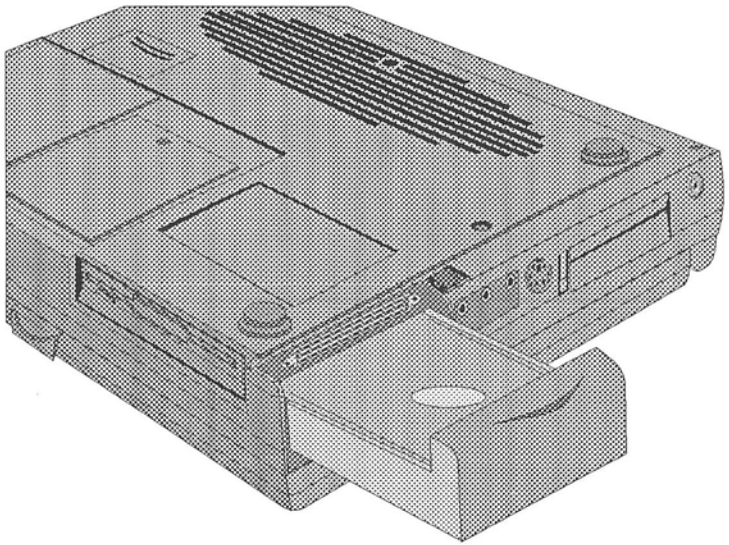
Note:	Before you can use your hard disk drive, the drive must be partitioned and formatted. Your dealer may have done this for you already. If not, refer to the user's manual for your operating system.

To replace a hard disk drive:

1. Turn off the power to your notebook computer. (Make sure it is *completely off* before you remove the hard disk drive, and not just in suspend mode!)
2. Close the LCD screen and turn your computer over.
3. Slide the hard disk drive release latch to the left.
4. Gently but firmly pull the hard disk drive away from the computer. Try to apply even pressure to avoid damage.
5. When the drive is partially pulled out there should be little resistance removing the drive. You can now easily slide it the rest of the way out.
6. Slide the new hard disk drive into the compartment until you meet minor resistance.

7. With you hand, firmly push the drive into place. If installed correctly, the outer cover of the hard disk drive should be flush with the rest of the computer.
8. If the new hard disk has a different number of heads, cylinders, tracks, and/or sectors per track than the old one, you may need to reconfigure your BIOS using System Setup. (See chapter 5 for details.)

Figure 11. Replacing the hard disk drive.



3.7 Inserting / Removing a CD-ROM

Your notebook comes with a CD-ROM disk drive. Usually the CD-ROM drive is assigned as Drive D; Drive C being your Hard Disk drive, and Drives A and B being your Floppy Diskettes drive. You can play data disks, audio discs, photo discs, and CDI video discs depending on the software you have.

CD-ROMs are a high density medium (contain a lot of data), that must be handled with care and kept clean to ensure that they remain readable. Keep in mind the following to ensure their reliability.

Always hold a CD-ROM by the edges. The side of the CD that has no writing on it is the side that contains the data.

- Do not touch the surface of the CD-ROM.
- Do not write on the surface.
- Do not store or place the CD-ROM in direct sunlight.
- Do not flex or bend the CD-ROM.
- Do not use benzene, thinners, or other cleaners to clean the CD-ROM. Use a CD-ROM cleaner kit.
- Promptly replace the CD-ROM in it's case when it's not in use.

To remove dust or fingerprints, wipe the CD-ROM from the center to the edge of the disc using a lint-free cloth.

Warning:	Failure to follow these suggestions may result in loss of data, reading failures, and/or permanent damage to the CD-ROM.

To insert a CD-ROM, do the following:

1. Turn on the computer.
2. Push the CD-ROM eject button on the right side of the computer. The CD-ROM tray should come out a little bit. Gently pull the tray all the way out.
3. Carefully pick up the CD-ROM by the edges and make sure the shiny surface is face down (the side with no writing on it). Carefully insert the CD-ROM onto the tray. Push the tray into the computer until it fully closes.

To remove a CD-ROM, do the following:

1. Check and make sure that the CD-ROM drive light is off.
2. Push the CD-ROM eject button on the right side of the computer. The CD-ROM tray should come out a little bit. Gently pull the tray all the way out.
3. Carefully pick up the CD by the edges and remove the CD-ROM from the tray. Push the tray into the computer until it fully closes.

Music, photo, and some video CD's require specific applications software. To use these, refer to the manuals that came with the software application.

3.8 Inserting/Removing a Floppy Diskette

You can use the following types of diskettes in your 3.5 inch, 1.44 MB floppy disk drive.

720 KB

1.2 MB

1.44 MB

To insert a diskette, hold it with the label facing up and the shutter leading into the drive. Slide it into the drive until it clicks into place.

To remove the diskette, make sure the diskette drive light is off: then press the release button. When the diskette comes out, remove it and store it properly.

Note:	Never remove a diskette, reset or turn off the computer while the diskette drive is being accessed; you could lose data. Also, be sure to remove the diskette before you turn off the computer.

4 Connecting Peripheral Devices

To expand your computing capabilities, you can add a variety of external devices to your computer. You may, for example, want to add a mouse, modem, or a printer. An *interface* is a set of rules that the computer follows for transferring data over a data cable – including what voltages are used, what the signals on each wire stand for, and so on. The computer is equipped with several interface ports, including an enhanced Centronics (parallel) port and a serial port. These are provided as a means of connecting peripheral devices to the computer.

Connect peripheral devices to the computer's interface ports as described below.

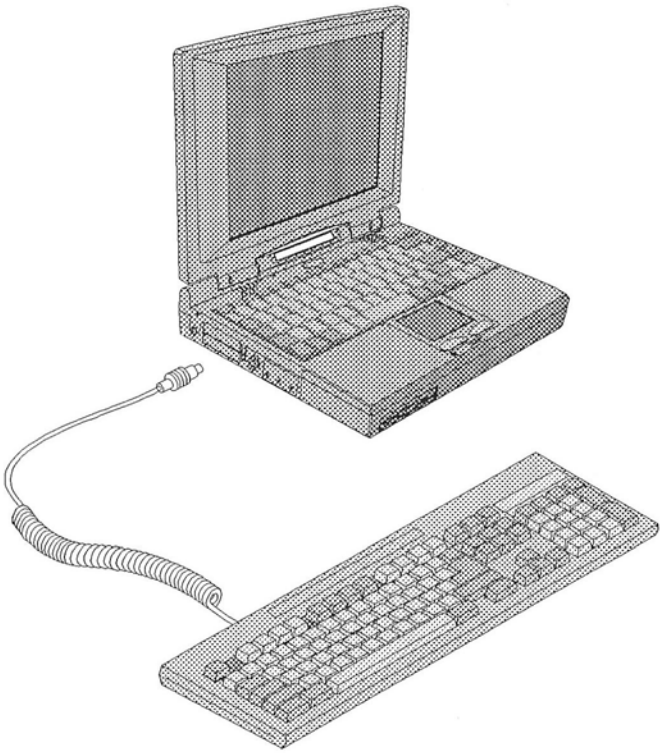
External Keyboard/Numeric Keypad

You can use your notebook computer with an optional external keyboard, numeric keypad, or IBM PS/2 compatible mouse.

To connect an external keyboard to your computer:

1. Place the keyboard at the front of the computer or in another location appropriate for typing.
2. Plug the keyboard cable connector into the keyboard socket on the left side of the computer.
3. Adjust the legs on the underside of the keyboard for a comfortable typing angle.

Figure 12. Connecting an external keyboard.



To connect a PS/2 compatible mouse to your computer:

1. Plug the PS/2 mini-din connector into the keyboard/mouse socket on the left of the computer.
2. The mouse can work immediately after being plugged in. Additionally it can be used with the internal Touch Pad at the same time.

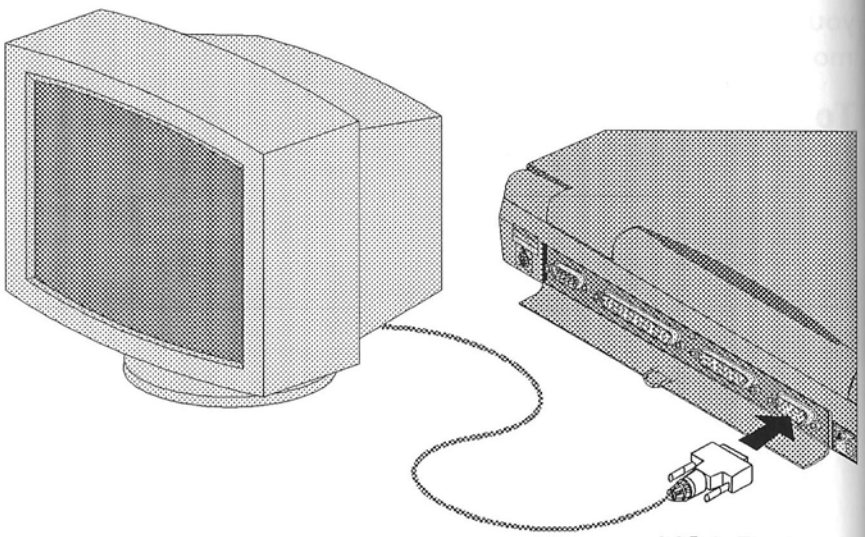
External Monitor

You can use an optional external VGA/SVGA display monitor with your computer. Consult your dealer for information on your display monitor.

To connect an external VGA/SVGA display monitor to the computer (you need a small screwdriver to connect the cable):

1. Place the monitor in a convenient location near the notebook computer.
2. Plug the monitor's power cable into a wall outlet.
3. Plug the monitor's signal connector into the external VGA/SVGA connector on the rear panel of the computer.
4. Secure the signal connector firmly to the video connector with the two small screws on the connector.
5. Before you turn on the monitor, turn on your computer and use the System Setup to designate the screen(s) that you want to use.
6. Turn on the monitor and adjust the monitor stand so that you have a good viewing angle of the screen.

Figure 13. Connecting an external display monitor.



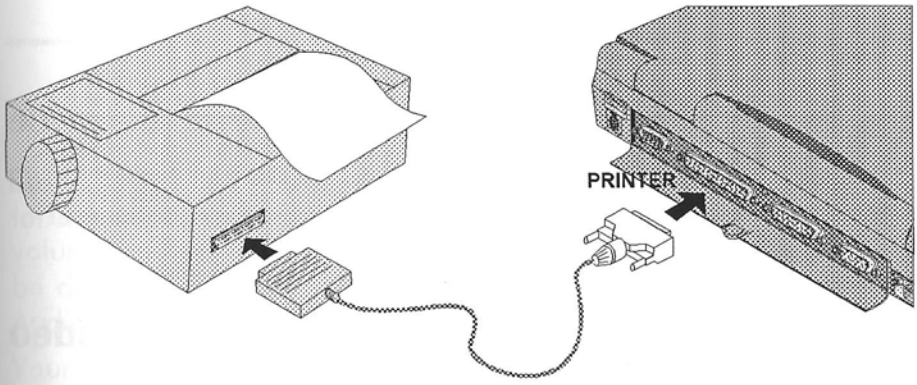
Parallel Printer

Your notebook computer is equipped with an enhanced bi-directional Centronics parallel port. Use the parallel port to connect the computer to a printer or plotter.

The Centronics parallel port is the most widely used interface on personal computers because it usually does not require setup commands or special configurations on either the computer or the peripheral device.

After you connect a peripheral device to a parallel port, secure the two small screws on the connector.

Figure 14. Connecting a printer.



Serial Device

The rear panel of the notebook computer has a standard RS-232C serial interface port. Use the serial port to connect a peripheral device that can both input data to the computer and receive data from the computer. Serial ports are widely used on everything from mainframe computers to display terminals and modems.

The serial port on the rear panel is designated COMA. The COM port designation is a conventional way to tell your software which I/O (input/output) address to use in order to send and receive data. These I/O addresses are defined by IBM in their *Technical Reference* manuals, and are understood by all popular software manufacturers.

After you connect a peripheral device to the serial port, secure the two small screws on the connector.

Note:	You cannot use the TouchPad and a serial mouse at the same time. In order to use a serial mouse, first disable the TouchPad. Then enable and configure the mouse as specified by the manufacturer.

MIDI/Game Device

The rear panel of the notebook computer has a standard MIDI/Game port. Connect either MIDI equipment or a joystick for your games to this port.

Composite Video

The jack located at the rear of the left side panel is the Composite Video output jack. This is where you connect one end of the composite video connector. The other end of the connector would be connected to the video-in jack of the television you're sending the video image to.

The composite video complies with both the NTSC and PAL standards.

Audio Sources and Output Devices

The built-in audio features of your notebook let you record and playback sound from a variety of sources.

These features include:

- 16-bit stereo sound that supports Microsoft Windows, Microsoft Sound System, and most programs that use the SoundBlaster Pro standard.
- The ability to perform real-time recording with compression and decompression.

- Scalable sampling rate (from 4 to 44.1 kHz) and compression ratios that give complete control of record time to required storage ratio.
- Digitally controlled volume with musting.
- Stereo microphone line-in, auxiliary line-in and speaker line-out for maximum flexibility.
- Built-in microphone and speaker to enhance portability.

To adjust the volume of your internal speakers or speakers attached to the stereo speaker port, Use the <Fn + F6> keys to reduce the volume and the <Fn + F7> to increase the volume. This can also be done by opening the Volume Control application located in the Audio Applications window.

Your computer comes with several software utilities and programs already installed. Among these is a group of programs which let you control the computer's various audio capabilities. For more information on these utilities and programs, see Chapter 6.

Docking Station

The optional stationary docking station includes the following features:

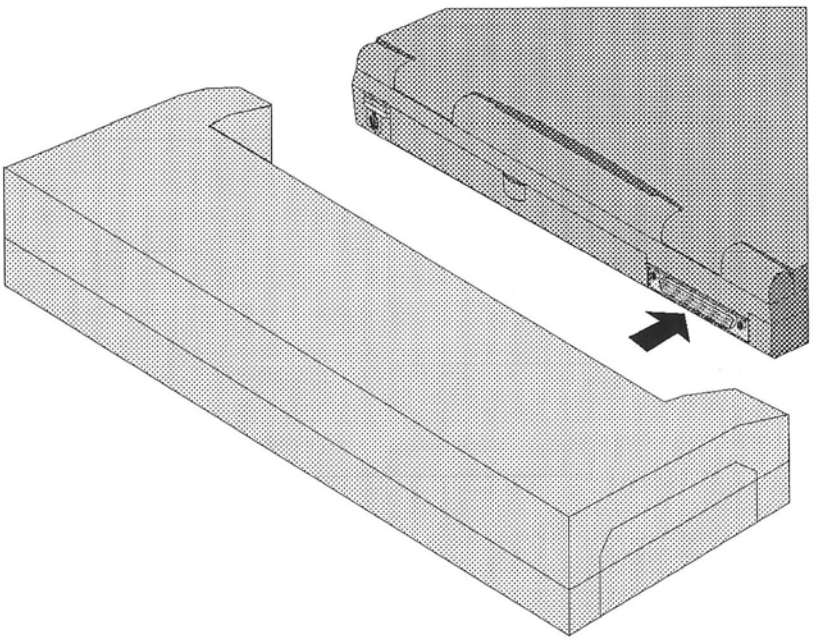
- Expansion slots for 2 PCI expansion cards.
- External keyboard connector
- Serial ports (2)
- MIDI/GAME port
- Printer port (Centronics)
- VGA/SVGA connector
- AC Input
- Power button

When the computer is connected to a docking station, the docking station controls power to the computer (the computer's DC IN connector will be covered).

To connect your computer to a docking station:

1. Place the computer so that you have access to its rear panel.
2. Plug the docking station into the 300 pin docking station connector on the computer's rear panel.
3. Plug the power cord into the AC Input connector on the docking station.
4. Connect the power cord to a wall outlet.
5. To run the computer, press either the docking station's power button or the notebook's power button.

Figure 15. Connecting a docking station.



Note:	Make sure the computer is turned off before plugging it into the docking station

5 Running System Setup

This chapter instructs you in using the System Setup that is included in the computer's ROM BIOS.

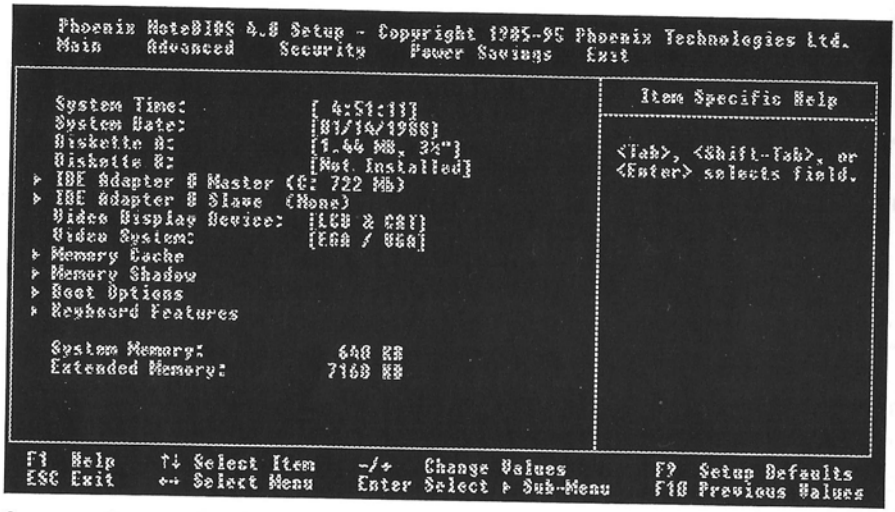
5.1 Overview

The System Setup is a ROM-based configuration utility that displays the system's configuration status and provides users with a tool to set their system parameters. These parameters are stored in non-volatile battery-backed CMOS RAM which saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS. Using easy-to-use pull down menus, users can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Shadow memory options
- Cache memory options

5.2 Accessing System Setup

To access System Setup, hit <F2> while the computer is booting-up. A screen similar to the following appears.



System Setup displays the system's current configuration settings. The top of the screen has a menu bar with various items (i.e., Main, Advanced, Power Savings, etc.). Some menu bar items contain pull-down menus that list the various items to configure the system, while others perform specified tasks. For example, the Main menu contains a menu consisting of such items as setting the time, configuring hard disks, and setting the video display type while the Power Savings menu bar item brings up Phoenix's Power Management menu.

5.3 The Menu Bar

The Menu Bar at the top of the window lists these selections:

Main	Use this menu for basic system configuration.
Advanced	Use this menu to set the Advanced Features available on your system's chipset.
Security	Use this menu to set User and Supervisor Passwords and the Backup and Virus-Check reminders.
Power Savings	Use this menu to configure Power-Management features.

Exit	Exits the current menu.

Use the left/right "← →" arrow keys to make a selection.

See section 5.8, "Exiting Setup," for a description on exiting the Main Menu.

The Legend Bar

Use the keys listed in the legend bar on the bottom to make your selections or exit the current menu. The chart on the following page describes the legend keys and their alternates:

Key	Function
<F1> or <Alt-H>	General Help window (See below).
<Esc>	Exit this menu.
← or → arrow keys	Select a different menu.
↑ or ↓ arrow keys	Move cursor up and down.
<Tab> or <Shift-Tab>	Cycle cursor up and down.
<Home> or <End>	Move cursor to top or bottom of window.
<PgUp> or <PgDn>	Move cursor to next or previous page.
<F5> or <->	Select the Previous Value for the field.
<F6> or <+> or <Space>	Select the Next Value for the field.
<F9>	Load the Default Configuration values for this menu.
<F10>	Load the Previous Configuration values for this menu.
<Enter>	Execute Command or Select P Submenu.
<Alt-R>	Refresh screen.

To select an item, use the arrow keys to move the cursor to the field you want. Then use the plus-and-minus value keys to select a value for that field. The Save Values commands in the Exit Menu save the values currently displayed in all the menus.

To display a sub menu, use the arrow keys to move the cursor to the sub menu you want, Then press <Enter>. A "P" pointer marks all sub menus.

The Item Specific Help Window

The help window on the right side of each menu displays the help text for the currently selected field. It updates as you move the cursor to each field.

The General Help Window

Pressing <F1> or <Alt-H> on any menu brings up the General Help window that describes the legend keys and their alternates. The scroll bar on the right of any window indicates that there is more than one page of information in the window. Use <PgUp> and <PgDn> to display all the pages. Pressing <Home> and <End> displays the first and last page. Pressing <Enter> displays each page and then exits the window.

Press <Esc> to exit the current window.

5.4 Main Menu Selections

You can make the following selections on the Main Menu itself. Use the sub menus for other selections.

Feature	Options	Description
System Time	HH:MM:SS	Set the system time.
System Date	MM/DD/YYYY	Set the system date.

Diskette A: Diskette B:	360KB, 5 1/4" 1.2MB, 5 1/4" 720KB, 3 1/2" 1.44M, 3 1/2" 2.88MB, 3 1/2" Not installed	Select the type of floppy-disk drive installed in your system.
Video Display Device	LCD CRT	Selects the video type.
Video System	Monochrome EGA/VGA, CGA 40x25, CGA 80x25,	Select the default video device.
System Memory	N/A	Displays amount of conventional memory detected during bootup.
Extended Memory	N/A	Displays the amount of extended memory detected during bootup.

IDE Adapters

The IDE adapters control the hard disk drives. *Phoenix* NoteBIOS 4.0 supports up to two IDE adapters. Each adapter supports one master drive and one optional slave drive in these possible combinations:

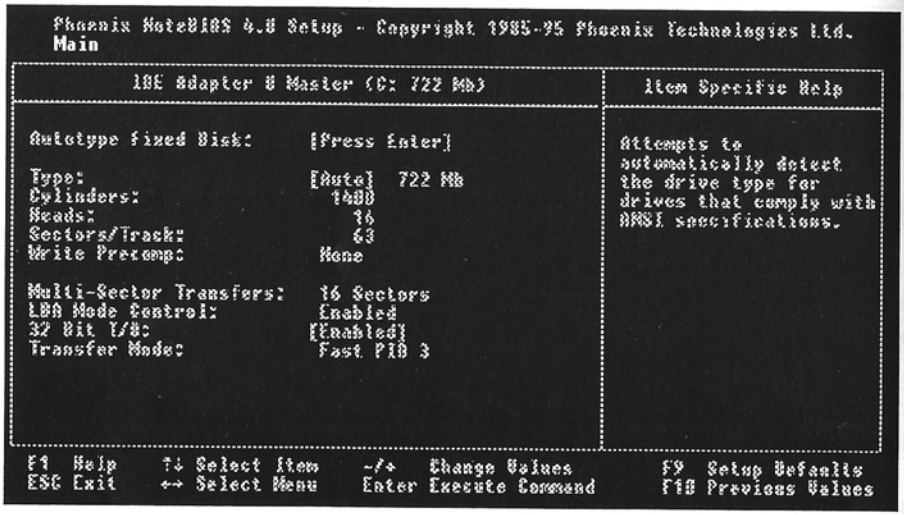
1 Master

1 Master, 1 Slave

Use a separate sub menu to configure each hard-disk drive.

Advanced Hard Disk Features—Not Installed

If Advanced Hard Disk Features are not installed, selecting one of the IDE Adapter sub menus on the Main Menu displays a menu like this:



Use the legend keys listed on the bottom to make your selections and exit to the Main Menu. Use the following chart to configure the hard disk.

Feature	Options	Description
Autotype Fixed Disk	N/A	Pressing <Enter> causes the system to attempt to detect the type of fixed disk. If successful, it fills in the remaining fields on this menu.
Type	1 to 39 User	1 to 39 fills in all remaining fields with values for predefined disk type. "User" prompts user to fill in remaining fields.
Cylinders	1 to 2048	Number of cylinders.
Heads	1 to 16	Number of read/write heads.
Sectors/Track	1 to 64	Number of sectors per track.

Landing Zone*	1 to 2048	Number of the cylinder specified as the landing zone for the read/write heads.
Write Precomp*	1 to 2048 None	Number of the cylinder at which to change the write timing.
Multi-Sector Transfers	Auto 2 sectors 4 sectors 8 sectors 16 sectors	Auto sets the number of sectors per block at the highest number supported by the drive. This is not always the fastest option.
LBA Mode Control	Enabled Disabled	Enables Logical Block Access. Default is Disabled.
32-Bit I/O	Enabled Disabled	Enables 32-bit communication between CPU and IDE card. Requires PCI or local bus.
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3	Selects the method for transferring the data between the hard disk and system memory. The Setup menu only lists those options supported by the drive and platform.

* IDE drives do not require setting Landing Zone and Write Precomp.

Warning: Incorrect settings can cause your system to malfunction.

Advanced Hard Disk Features—Installed

If Advanced Hard Disk Features are installed, selecting one of the IDE Adapter sub menus on the Main Menu displays a menu. Use the legend keys listed on the bottom to make your selections and exit to the Main Menu. Use the following chart to configure the hard disk drive with Advanced Hard Disk Features:

Feature	Options	Description
Autotype Fixed Disk	N/A	Pressing <Enter> at this field attempts to read the hard disk parameters from the drive itself and sets the following options to their optimum setting. "Sets Type field to "User" and allows editing of other fields.
Type	1 to 39 User Auto	1 to 39 fills in all remaining fields with values for predefined disk type. "User" prompts user to fill in remaining fields. "Auto" autotypes at each boot, displays settings in Setup menu and does not allow editing of remaining fields.
Cylinders	1 to 16,384	Number of cylinders.
Heads	1 to 16	Number of read/write heads.
Sectors/Track	1 to 63	Number of sectors per track.
Landing Zone*	N/A	Obsolete.
Write Precomp*	N/A	Obsolete.
Multi-Sector Transfers	Auto 2 sectors 4 sectors 8 sectors 16 sectors	Auto sets the number of sectors per block at the highest number supported by the drive. This is not always the fastest option.
LBA Mode Control	Enabled Disabled	Enables Logical Block Access. Default is Disabled.
32-Bit I/O	Enabled Disabled	Enables 32-bit communication between CPU and IDE card. Requires PCI or local bus.

Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3	Selects the method for transferring the data between the hard disk and system memory. The Setup menu only lists those options supported by the drive and platform.

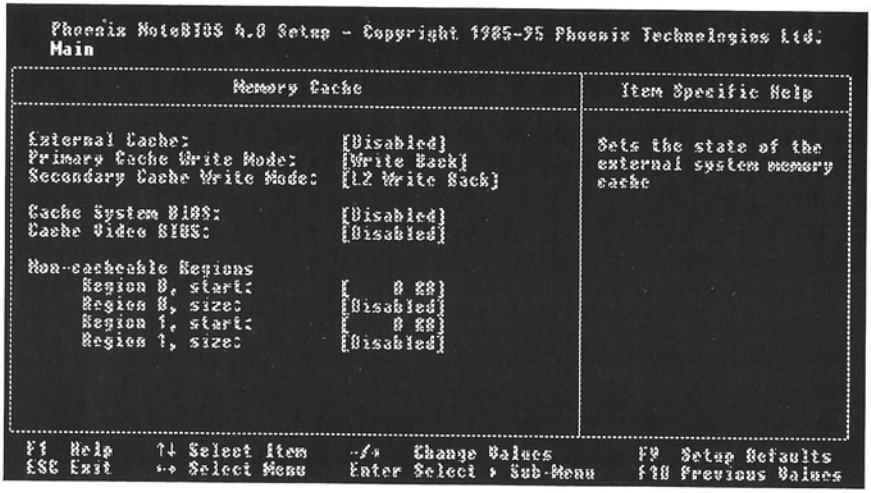
* IDE drives do not require setting Landing Zone and Write Precomp.

Warning: Incorrect settings can cause your system to malfunction.

Memory Cache

Enabling **cache** saves time for the CPU by holding data most recently accessed in regular memory (dynamic RAM or DRAM) in a special storage area of static RAM (SRAM), which is faster. Before accessing regular memory, the CPU first accesses the cache. If it does not find the data it is looking for there, it accesses regular memory.

Selecting "Memory Cache" from the Advanced Setup menu displays a menu like the one shown here. The actual features displayed depend on your system's hardware.



Use the legend keys listed on the bottom to make your selections and exit to the Main Menu.

Use the chart on the following page to configure the memory cache.

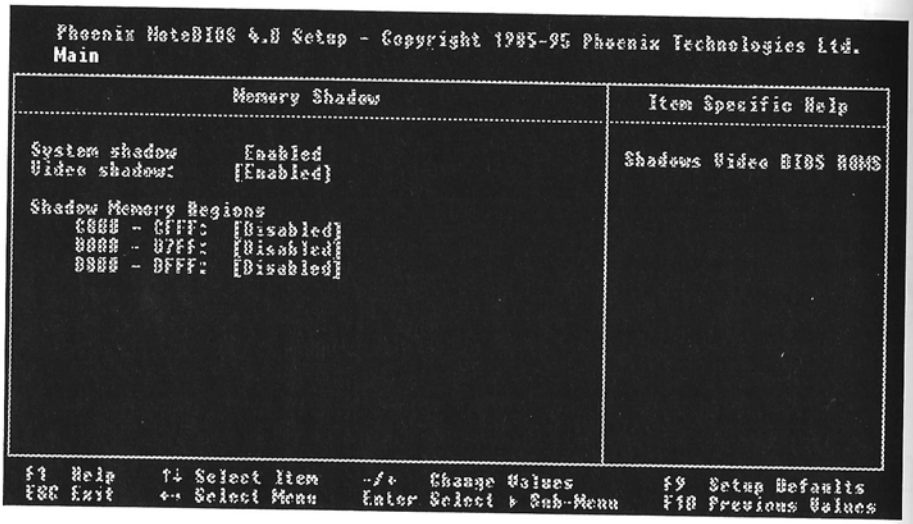
Feature	Options	Description
External Cache	Enabled Disabled	Enables or disables secondary cache.
Primary Cache Write Mode	Write Back Write Through	Controls primary cache operations mode.
Secondary Cache Write Mode	L2 Write Back L2 Write Through Adaptive Write Back	Enables secondary cache operations mode.
Cache System BIOS	Enabled Disabled	Caches the system BIOS and improves performance.
Cache Video BIOS	Enabled Disabled	Caches the video BIOS and improves performance.
Non-cacheable regions:		Specifies areas of regular and extended memory as non-cacheable regions.

Region 0, start	0 Multiples of 64	Multiples of 64 define start of non-cacheable region 0 in kilobytes.
Region 0, size	Disabled Multiples of 64	Disabling makes this region available for cache. Multiples of 64 define size of non-cacheable region 0 in kilobytes.
Region 1, start	0 Multiples of 64	Multiples of 64 define start of non-cacheable region 1 in kilobytes.
Region 1, size	Disabled Multiples of 64	Disabling makes this region available for cache. Multiples of 64 define size of non-cacheable region 1 in kilobytes.

Warning: Incorrect settings can cause your system to malfunction.

Memory Shadow

Selecting "Memory Shadow" from the Main Menu displays a menu like the one shown here. The actual features displayed depend on the capabilities of your system's hardware.



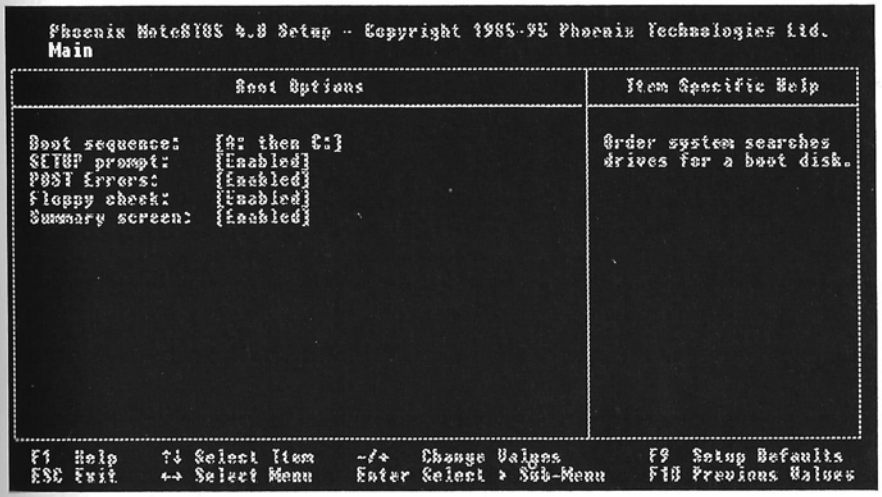
Use the legend keys to make your selections and exit to the Main Menu. Use the following chart to configure memory shadowing.

Feature	Options	Description
System shadow	N/A	Usually permanently enabled.
Video shadow	Enabled Disabled	Shadows video BIOS and improves performance.
Shadow Memory Regions	Enabled Disabled	Shadows option ROM located in the specified segments of memory and can improve performance. WARNING: Some option ROMs do not work properly when shadowed.

Warning: Incorrect settings can cause your system to malfunction.

Boot Options

Selecting "Boot Options" on the Main Menu displays the Boot Options menu.

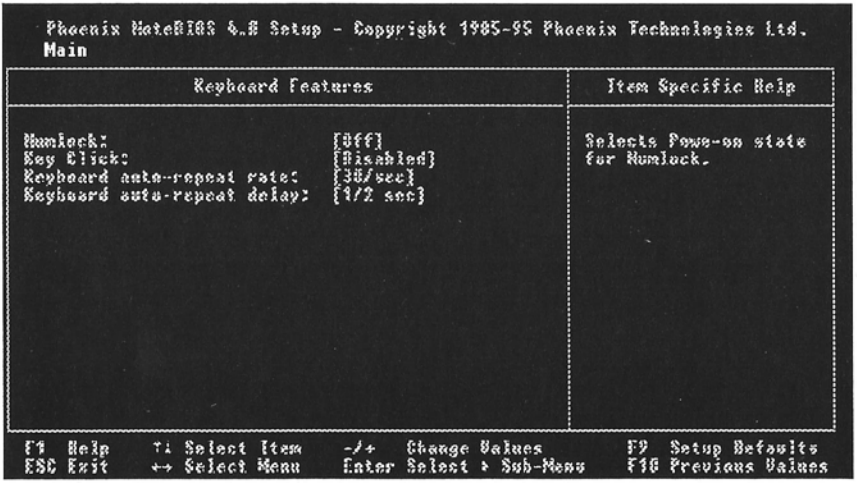


Use the legend keys to make your selections and exit to the Main Menu. Use the following chart to select your boot options.

Feature	Options	Description
Boot sequence	A: then C; C: then A: C: only	The BIOS attempts to load the operating system from the disk drives in the sequence selected here.
Setup prompt	Enabled Disabled	Displays "Press <F2> for Setup" during bootup.
POST errors	Enabled Disabled	At boot error, pauses and displays "Press <F1> to resume, <F2> to Setup".
Floppy seek	Enabled Disabled	Seeks diskette drives during bootup. Disabling speeds boot time.
Summary screen	Enabled Disabled	Displays system summary screen during bootup.

Keyboard Features

Selecting "Keyboard Features " on the Main Menu displays the Keyboard Features menu:

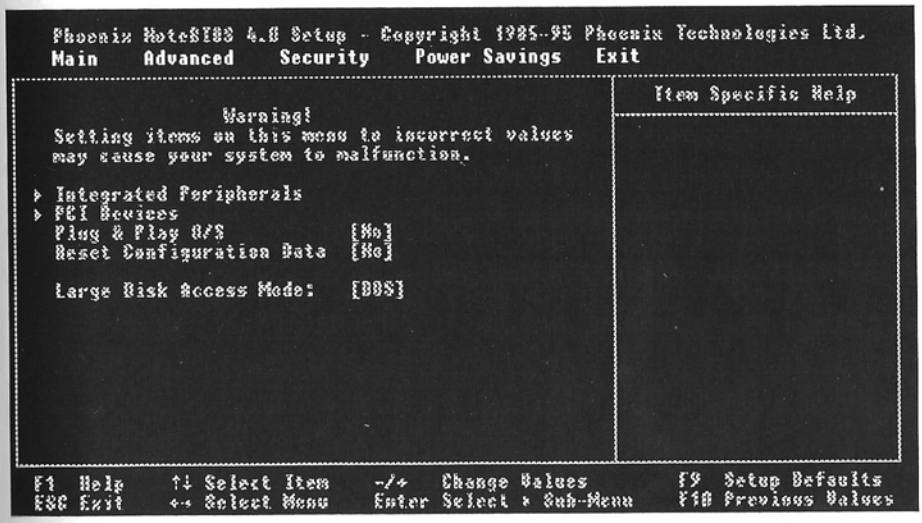


Use the legend keys to make your selections and exit to the Main Menu. Use the following chart to configure the keyboard features:

Feature	Options	Description
NumLock	Auto On Off	On or Off turns NumLock on or off at bootup. Auto turns NumLock on if it finds a numeric key pad.
Key Click	Enabled Disabled	Turns audible key click on.
Keyboard auto-repeat rate	2/sec 6/sec 10/sec 13.3/sec 21.8/sec 26.7/sec 30/sec	Sets the number of times a second to repeat a keystroke when you hold the key down.
Keyboard auto-repeat delay	1/4 sec 1/2 sec 3/4 sec 1 sec	Sets the delay time after the key is held down before it begins to repeat the keystroke.

5.5 The Advanced Menu

Selecting "Advanced" from menu bar on the Main Menu displays a menu like this:



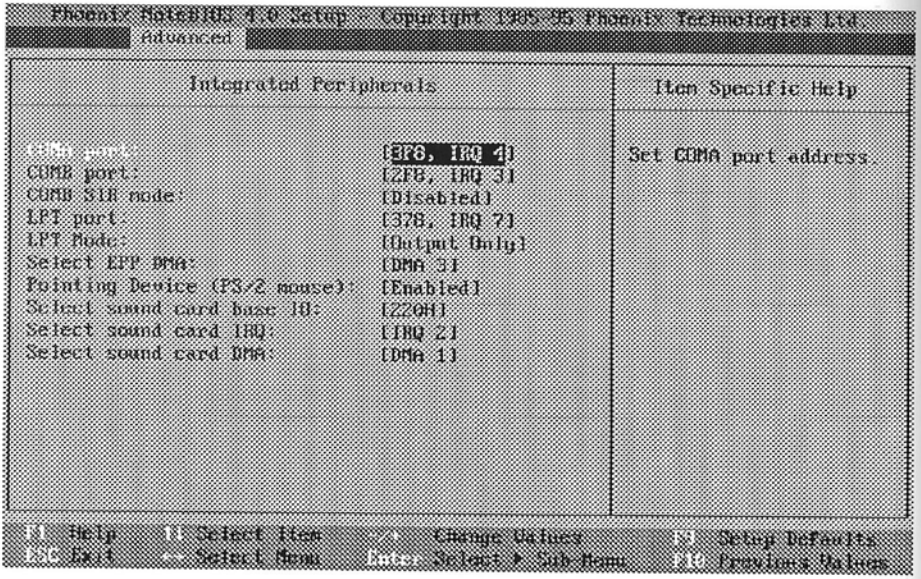
Use the legend keys to make your selections. The Integrated Peripherals and PCI Devices Selections have submenus that will be explained in a later section. The following options are available from this menu.

Feature	Options	Description
Plug & Play O/S	Yes No	Activates the Plug & Play O/S.
Reset Configuration Data	Yes No	Resets the configuration data.

Large Disk Access Mode	DOS Other	Select DOS if you have DOS. Select Other if you have another operating system such as UNIX. A large disk is one that has more than 1024 cylinders, more than 16 heads, or more than 63 tracks per sector.

Integrated Peripherals Menu

Most chipsets manage the connections between the CPU and the I/O ports (COM: and LPT:), the floppy disks, and the hard-drive controllers. Some systems have a separate on-board chip for handling these items. If your system has a separate on-board I/O chip, selecting "Integrated Peripherals" menu on the Advanced Menu displays a menu like this:



Use the legend keys to make your selections and exit to the Main Menu.

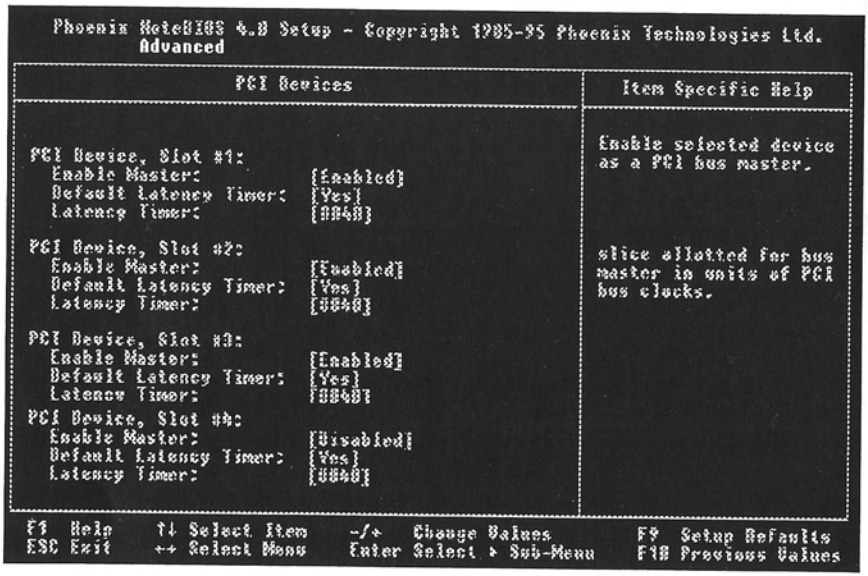
Use the following chart in configuring the chipset:

Feature	Options	Description
COM port A COM port B	Disabled 3F8, IRQ 4 2F8, IRQ 3 3E8, IRQ 4 2E8, IRQ 3 Auto	Select a unique address and interrupt request for the listed COM ports. Auto selects the next available combination.
COMB SIR mode	Enabled Disabled	Enables the IR Port (uses COM B).
LPT port	Disabled 278, IRQ 5 278, IRQ 7 378, IRQ 5 378, IRQ 7 Auto Disabled	Select a unique address and interrupt request for the LPT port. Auto selects the next available combination.
LPT Mode	Output Only Bi-directional ECP	Selects the I/O flow from the LPT port.
Pointing Device (PS/2 Mouse)	Enabled Disabled	Enables the Pointing Device (Touch Pad).
Select Sound Card Base I/O:	220H, 230H, 240H, 250H	Selects the I/O address for the sound card.
Select Sound Card IRQ:	2, 5, 7, 10	Selects the IRQ for the sound card.
Select Sound Card DMA:	None, 0, 1, 3	Selects the DMA for the sound card.

NOTE: Incorrect settings can cause your system to malfunction.

PCI Devices Menu

If the system has a PCI bus, selecting "PCI Devices" from the menu bar on the Advanced menu displays a menu like this:



PCI Devices are add-on devices equipped for operation with a PCI (Peripheral Component Interconnect) bus, the group of wires that connect the CPU with add-on devices. Use this menu to configure the PCI bus and the devices connected to it.

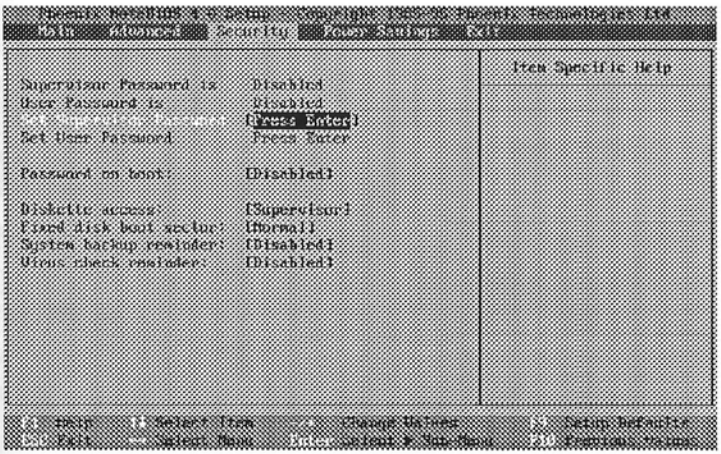
Use the legend keys to make your selections and exit to the Advanced menu. Use the following chart in configuring the chipset:

Feature	Options	Description
PCI Device, Slots #1, #2, #3, #4		
Enable Master	Disabled Enabled	Enables selected device as a PCI bus master. Not every device can function as a master. Check your device documentation.
Default Latency Timer	Yes No	If yes, do not program latency timer.
Latency Timer	0000h to 0280h	Maximum number of PCI bus clocks that master may burst.

NOTE: The contents of this menu depend on the chipset installed on your motherboard, and chipsets vary widely. Consult your dealer or the chipset manual before changing the items on this menu. Incorrect settings can cause your system to malfunction.

5.6 The Security Menu

Selecting "Security" from the Main Menu displays a menu like this:



Use the legend keys to make your selections and exit to the Main Menu.

Enabling "Supervisor Password" requires a password for entering Setup. The passwords are not case sensitive.

Pressing <Enter> at either Set Supervisor Password or Set User Password displays a dialog box. Type the password and press <Enter>. Renter the password to confirm.

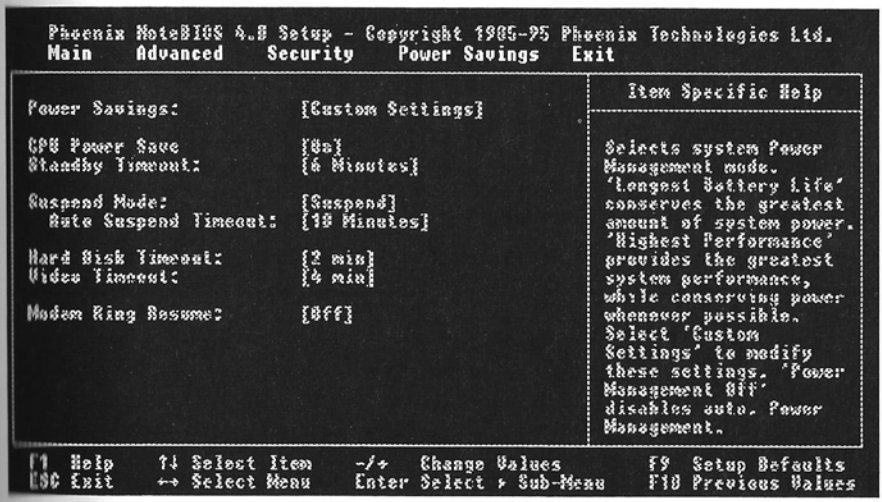
Use the following chart to configure the system-security and anti-virus options.

Feature	Options	Description
Supervisor Password	Enabled Disabled	Gives full access to the SETUP menus.
User Password	Enabled Disabled	Gives restricted access to the SETUP menus.
Supervisor Password	Up to seven alphanumeric characters	Pressing <Enter>displays dialog box for entering the supervisor password.
Set User Password	Up to seven alphanumeric characters	Pressing <Enter> displays the dialog box for entering the user password. Requires prior setting of Supervisor password.
Password on boot	Enabled Disabled.	Enabled requires a password on boot. Requires prior setting of the Supervisor password. If supervisor password is set and this option disabled, BIOS assumes user is booting.
Diskette Access	Supervisor User	Supervisor restricts use of floppy drives to supervisor. Requires setting the Supervisor password.
Fixed disk boot sector	Normal Write Protected.	Write protected helps prevent viruses.

System backup reminder Virus check reminder	Disabled Daily Weekly Monthly	Displays a message during bootup asking (Y/N) if you have backed up the system or scanned it for viruses. Message returns on each boot until you respond with "Y". Daily displays the message on the first boot of the day, Weekly on the first boot after Sunday, and Monthly on the first boot of the month.

5.7 The Power Savings Menu

Selecting "Power Savings" from the menu bar displays a menu like this:



Use this menu to specify your settings for Power Management. Remember that the options available depend upon the hardware installed in your system. Those shown here are from a typical system.

A power-management system reduces the amount of energy used after specified periods of inactivity. The Setup menu pictured here

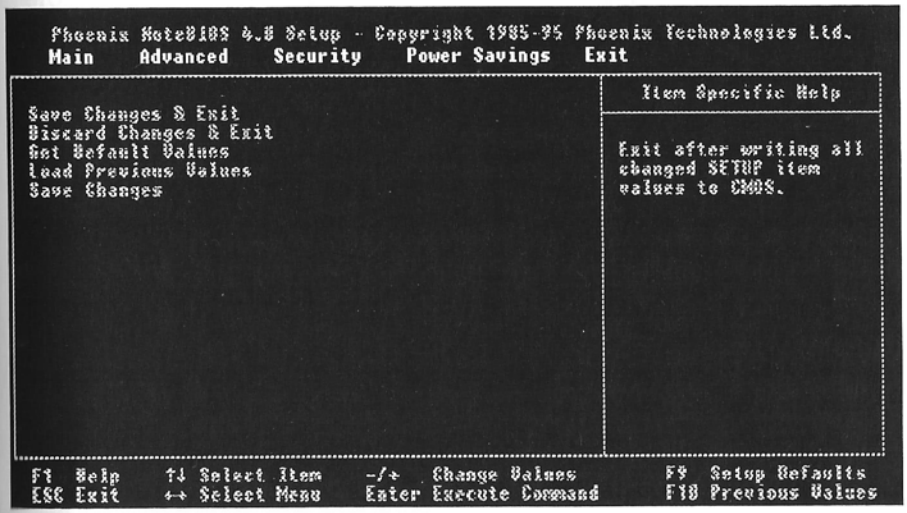
supports a Full On state, a Standby state with partial power reduction, and a Suspend state with full power reduction.

Use the legend keys to make your selections and exit to the Main Menu. Use the following chart in making your selections:

Feature	Options	Description
Power Savings	Disabled Customize Max. Power Savings Med. Power Savings Min. Power Savings	Max., Med., and Min. set power-management options with pre-defined values. Select Customize to make your own selections from the following fields. Disabled turns off all power management.
CPU Power Save	On Off	When on it helps save power consumption by the CPU.
Standby Timeout	Disabled Enabled (Variable times)	Inactivity period required to put system in Standby (partial power shutdown).
Suspend Mode	Suspend Save to Disk	Select Suspend Mode.
Auto Suspend Timeout	Disabled Enabled (Variable times)	Inactivity period required after Standby to Suspend (maximum power shutdown).
Hard Disk Timeout	Disabled Enable (Variable times)	Inactivity period of fixed disk required before standby (motor off).
Video Timeout	Disabled Enabled (Variable times)	Inactivity period of monitor required before standby.
Modem Ring Resume	On Off	On returns computer to normal mode when call is received.

5.8 The Exit Menu

Selecting "Exit" from the menu bar displays this menu:



The following sections describe each of the options on this menu. Note that <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

Save Changes and Exit

After making your selections on the Setup menus, always select either "Save Changes & Exit" or "Save Changes" if you want the changes you've made to be used the next time you boot-up your computer. Both procedures store the selections displayed in the menus in CMOS (short for "battery-backed CMOS RAM") a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS.

If you attempt to exit without saving, the program asks if you want to save before exiting.

During bootup, *Phoenix* NoteBIOS 4.0 attempts to load the values saved in CMOS. If those values cause the system boot to fail, reboot and press <F2> to enter Setup. In Setup, you can get the Default Values (as described below) or try to change the selections that caused the boot to fail.

Discard Changes & Exit

Use this option to exit Setup without storing in CMOS any new selections you may have made. The selections previously in effect remain in effect.

Get Default Values

To display the default values for all the Setup menus, select "Get Default Values" from the Main Menu.

The CMOS values may have been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS.

Press <F1> to resume the boot or <F2> to run Setup with the ROM default values already loaded into the menus. You can make other changes before saving the values to CMOS.

Load Previous Values

If, during a Setup Session, you change your mind about changes you have made and have not yet saved the values to CMOS, you can restore the values you previously saved to CMOS.

Selecting Load Previous Values on the Exit menu updates all the selections and displays this message:

Save Changes

Save Changes saves all the selections without exiting Setup. You can return to the other menus if you want to review and change your selections.

6 The Software Utilities Disks

This chapter describes the software utilities that are provided with your computer.

The instructions in this chapter assume that you understand elementary concepts of DOS. Before you attempt to install any driver or utility, you should:

- Know how to copy files from a floppy disk to a directory on a hard disk
- Understand the DOS directory structure

If you are uncertain about any of these concepts, refer to the DOS *Reference Guide* for more information. Additional information can be found in Readme.txt files located on these disks. To read these use the notepad in windows and open the appropriate file. During installation, most drivers will recommend a directory to place the driver in. If you are not experienced in configuring your computer, it is recommended that you use the directories suggested.

Before continuing, make backup copies of the disks, and store the original disks in a safe place.

6.1 Touch Pad Driver

The driver for the Touch Pad is found on the Touch Pad Driver diskette.

Before running *Install*, please make sure you have at least 20 file handles in your CONFIG.SYS. Add this line to your CONFIG.SYS if not already present:

```
FILES=20
```

Then put the disk that has the driver into your floppy drive, and at the command prompt from your floppy drive, type:

```
INSTALL
```

followed by carriage return. Follow the instruction on the screen to complete the installation.

6.2 PMU

The computer supports Advanced Power Management (APM) version 1.0 which is a power-management standard provided by Microsoft and Intel. APM will prolong the battery operating life and monitor battery status. *APM drivers for DOS and Windows* is a standard package from Microsoft. If you cannot find this utility program, contact your DOS or Windows supplier.

Installation

For DOS users, install the PMU by adding the following line to your CONFIG.SYS file:

```
DEVICE=C:\DOS\POWER.EXE
```

For Windows users, change the Windows setup to APM system by doing the following:

1. Execute "SETUP.EXE" in Windows directory.
2. Change the first option "System Setup" to MS-DOS System with APM.
3. Insert diskette 2 to complete the Setup procedure.

6.3 DOS Utility & Drivers

This section describes the operation and installation of the DOS Utility & Drivers supplied on the *GD7543 DOS & Utility* diskette that is shipped with your computer. To install you should be in stand-alone DOS.

Installation:

1. Insert the *GD7543 DOS & Utility* diskette into Drive A:.
2. Type A:\EINSTALL
3. Continue with the remainder of the installation.

CLMode

The CLMode utility allows the user to define the type of monitor attached, set the video mode timings supported by the CIRRUS LOGIC VGA, and preview them.

JCLMode

JCLMode has the same functionality as CLMode except that it is recommended that it be run in a Japanese DOS environment as it displays Japanese text.

Using CLMode's graphic interface

CLMode requires that the computer have 300KB of standard memory and 1MB of extended or expanded memory available for it to run. At the DOS prompt type CLMODE [Enter] .

When CLMode starts, the screen will go blank for a couple of seconds. During this time, CLMode is attempting to identify the monitors capabilities using the VESA Display Data Channel (DDC). In

its graphics mode, CLMode looks and works just like a Windows application.

The main window is used to select and configure the monitor that you have connected to the graphics adapter. Select the brand and model of the current monitor using the two drop down boxes. To get a scrollable list of available choices, click on the down arrow with the mouse. For keyboard only, hit the [Tab] key until the Monitor Brand field is highlighted, and use the cursor keys to move through the choices. If the correct brand is not available select 'Other Brand'. Move to the 'Monitor Model' field and select from the list provided. If 'Other Brand' was selected then the only choice will be 'Other Monitor'. If the monitor is not on the list select "Other Model'.

If the graphics adapter and the monitor both support VESA Display Data Channel, this will be the default choice. This means that CLMode was able to identify the monitor and knows what resolutions and refresh rates are available for the monitor.

Select the refresh rate for each resolution. If the monitor was selected by name, then selecting the highest refresh for each resolution will give the highest quality display. If 'Other Brand' or 'Other Model' was chosen, consult the manual that came with the monitor to determine the proper refresh rates.

At the bottom of the screen are six buttons. Each button represents a different option or window. The underlined letter of a button name specifies the hot key combination for that item. For example, press the [Alt] key and the underlined letter keys simultaneously. Note that to use a mouse, a mouse driver should be installed prior to running the CLMode utility.

In the lower right corner of the main window is configuration information about the graphics system. The information details the VGA BIOS version, the total display memory of the graphics controller, whether or not an EEPROM is present, and whether or not a centering TSR is loaded. This information is useful when installing software or getting technical support.

Preview video modes

Select the Preview button. The Video Modes Preview window displays a list of all of the modes supported based on the currently selected monitor timings and the amount of video memory present. This list of video modes will tell you which are available in your current configuration for use with extended resolution drivers. To see what different video modes look like on your monitor, select the Show button. After each test screen is displayed, press [Enter] . If you don't want to see any more video modes pressing [Esc] will return you to the Video Modes Preview window.

Option

The configuration window allows the user to set a specific display mode - CRT, Panel, SimulSCAN, TV (NTSC/PAL).

Getting help

Selecting the Help button from the main window will display instructions on using CLMode.

Information about CLMode

Selecting the About button will display version and copyright information about CLMode.

Undoing changes

To return all settings to their state when CLMode was started, select the Undo button.

Exiting the CLMode

To exit CLMode at any time, press the [Alt] and [F4] keys simultaneously, or click the left mouse button on the system button of the main window (i.e., the top left corner button of the window which is shown as a dot), select the Exit button, or press the [Esc] key.

Some boards are equipped with an EEPROM. This is memory that will not be erased when the computer is turned off. If the EEPROM is present, then CLMode will save its configuration information in the EEPROMs memory. If there is no EEPROM, CLMode will ask if the changes should be saved in the AUTOEXEC.BAT. In most cases, the end user should answer yes. Answering no means that the next time the computer is booted, all of CLMode's configuration information will be lost.

When the CLMode utility exits, the currently selected monitor brand, model, and timing information will be saved. The current monitor timings will be displayed.

Using CLMode's command line options

When command line options for CLMODE.EXE are given at the DOS prompt, the menu-driven windows will not be displayed. Instead, configuration, monitor type, video mode, and refresh rate will be set at the DOS prompt. To display the available command line syntax for CLMode, type:

CLMODE / ? [Enter]

Typing an invalid option will display the command line help text. Typing [S] as a command line option will display the current CLMode settings.

SWITCHER

The SWITCHER utility allows rapid configuration of the VGA subsystem. It is a TSR (Terminate and Stay Resident) program. That is, once loaded, it remains in memory and can be invoked by keystrokes from the keyboard. To run SWITCHER type:

SWITCHER [Enter]

After returning to the DOS prompt. The system then responds to individual SWITCHER commands.

Using the SWITCHER functions

The following table describes the various functions performed by SWITCHER and the corresponding keyboard commands necessary to invoke these functions.

Feature	Keystroke	Display Type
Black & White Enhancement ON/OFF	Ctrl-Alt-A	Mono panel only*
Switch between vertical positioning options (Top and Center)	Ctrl-Alt-C	All panels
Switch between flat panel, CRT, and SimulSCAN™	Ctrl-Alt-D	CRT, Panel, SimulSCAN
Expand mode ON/OFF	Ctrl-Alt-E	Panel SimulSCAN
Graphics shading	Ctrl-Alt-G	Mono panel only
Text shading	Ctrl-Alt-T	Mono panel only
NTSC TV Output	Ctrl-Alt-V	CRT, Panel, SimulSCAN
PAL TV Output	Ctrl-Alt-P	CRT, Panel, SimulSCAN
Reverse video ON/OFF	Ctrl-Alt-R	All panels
Screen power ON/OFF	Ctrl-Alt-S	CRT, Panel, SimulSCAN

* CL- G7543 does not support this option.

All SWITCHER commands operate in toggle mode. that is, each occurrence of a command causes the corresponding function to switch either to the opposite of its current state, if there are two states; or to the next state in line, if there are more than two states. Some of these options are only available in certain configurations.

WinMode

The WinMode utility configures your graphics system for Windows 3.1 in either DOS or OS/2 2.1x. It allows the user to change the monitor refresh rates, resolution, number of available colors, large or normal size fonts and font cache size.

WinMode assumes that the Windows drivers have been correctly installed and configured using the installation utility provided on the Windows 3.1 Drivers and Utilities Diskette.

For installation instructions see the section on Windows 3.1 drivers in this manual.

Warning:	Do not use WinMode to change Windows resolution while it is running under OS/2 3.0. It is not recommended by IBM to alter Windows resolution without also changing the OS/2 desktop. If user needs to change resolution on either OS/2 3.0 desktop or Win-OS/2, reinstall using the OS/2 3.0 driver disk.

Using WinMode

WinMode is run by selecting it's icon. The icon will be in the group that you specified during the install process. When WinMode is started the screen may blank for up to two seconds. This happens while WinMode attempts to discover the capabilities of the monitor. If this is successful, you will see only one choice besides the other brand and model choices in the Monitor Brand and Monitor Model drop down combo boxes.

The various sections are described hereunder.

Language selector

Open the control menu box in the upper left corner of the WinMode window and click the language selector. If the language of your choice is grayed out, you need to install the Windows driver diskette 2. See the Windows 3.1 Installation section for instructions.

Monitor brand

Select the brand of your monitor from the list provided in the drop down box. This will change the list of monitors in the Monitor Model drop down box to display only the models available under the selected brand. If your monitor brand is not listed, select Other Brand.

If your graphics adapter and monitor both support VESA Display Data Channel, this will be the default choice. This means that WinMode was able to identify the monitor and knows what resolutions and refresh rates are available for the monitor.

Monitor model

Select the current model from the list first presented. If your monitor is not listed select Other Monitor. If your graphics adapter and monitor both support VESA Display Data Channel, other monitor will be the default choice. This means that WinMode was able to identify the monitor and knows what resolutions and refresh rates are available for the monitor.

Monitor refresh rates

The drop down list boxes let you select the monitor refresh rates for each resolution. If you select Unavailable for any screen resolution, any higher resolutions will also be unavailable. This will also turn off the corresponding choices in the Resolution box.

The only choices that will be available are the ones available to the monitor that was selected in the Monitor Brand and Monitor Model fields. If Other Brand or Other Model were selected then all of the refresh rates available on the graphics adapter will be listed. Consult

the manual that came with your monitor to determine the best choices.

In general, the higher the refresh rate, the better the display quality and the lower the performance. This is because the graphics system can only do a fixed number of operations per second. The more time it spends redrawing the screen, the less time it has available to perform other operations.

Resolution

These buttons let you choose the resolution that WinMode will use to run Windows 3.1 after Windows is restarted. Some of these buttons may be unavailable because of the amount of video memory in your system or if some of the monitor refresh rates have been set to Unavailable.

Colors

These buttons let you choose the number of colors that will be available to Windows 3.1 after Windows is restarted. Some of these choices may be unavailable. This is because of the amount of video memory in your system and the resolution that you have selected. If you have chosen OS/2 v2.1 in the Operating System field, then the only possible choices are for 16 or 256 colors. Generally, 256 color mode will be the fastest choice. If you need more colors then there will be some slowdown in graphics performance.

Font size

The small fonts are intended for lower resolutions and higher resolutions on large monitors. With smaller monitors, the large fonts are more readable at higher resolutions.

Font cache size

The Font Cache Size lets you set the amount of system memory that will be available for font caching.

Next to the font cache size is an up arrow and a down arrow. Click on the up arrow to increase the cache size. Click on the down arrow to decrease the cache size.

Font caching is a technique to increase the performance of Windows by saving the bitmaps of frequently used characters. Normally, when a character is displayed on the screen it first is created from the Truetype outline then it is copied to the screen. A cached character has already been created and stored and so it is just copied as needed.

WinMode has tried to determine the correct setting for this field for you, but you may change it. Just remember that memory set aside for font caching will not be available for Windows program and system usage.

Operating system

The Operating System buttons let you set the operating system that you are running Windows in.

This is very important because the configuration and capabilities of the drivers are very different in OS/2 2.1x and DOS. The most obvious difference is that the drivers will only work in 256 color modes in OS/2 2.1x. For OS/2 3.0, do not run WinMode to change the Win-OS/2 configuration for the results are unpredictable.

OK

The OK button closes the dialog box and accepts the choices that you have made.

After clicking OK, your computer will be reconfigured to use the choices that you have made. These changes may need to be added to your AUTOEXEC.BAT file for them to be permanent. If this is necessary, you will be prompted by the program.

If WinMode detects that you changed your Windows 3.1 configuration, you will be asked if Windows should be restarted. If you answer yes, Windows will be restarted immediately, If you say

no, then you will have to exit Windows and restart it manually for the changes to take effect.

Cancel

The Cancel button closes the dialog box and exits the program without making any changes. Selecting Close from the control menu or double clicking on the control menu box will have the same effect.

About

The About button will display a dialog box with the version number of WinMode and a copyright notice.

Help

For help on WinMode, select the Help button. The main help screen contains an image of the WinMode screen. Place the cursor over the field(s) that you need help with. When the mouse pointer changes to a hand, click to display the help text for that field. Click again to make the pop-up text disappear.

Options

If your video system supports these options, this button is enabled. If not it is replaced with an icon.

The various sections are described below.

About

The 'About' button will display a dialog box with the version number of the Display Options utility and a copyright notice.

Cancel

The 'Cancel' button closes the dialog box and exits the program without making any changes. Selecting 'Close' from the control menu or double clicking on the control menu box will have the same effect.

Display type

When the dialog box is first displayed, this field will have the currently active display choice selected. Choose the display that you want to change to. (If your video system supports TV, NTSC TV and PAL TV buttons will be presented). The actual change will take place after selecting OK in the main screen of WinMode.

Depending on the other choices that have been made, either the changes will be made immediately, or Windows will need to be restarted for the changes to take effect. In general, if the only thing that is being changed is the resolution and the display type, and 'ChangeRes' has been selected, then the changes will be made without restarting Windows.

Otherwise, WinMode will decide whether restarting Windows is necessary. The only exception to this is when changing the display either to or from the TV, assuming that you have TV support. This will always cause Windows to restart.

Help

For help on Display Options in WinMode, select the Help button. The Options help screen contains an image of Display Option screen. Place the cursor over the field(s) that you need help with. When the mouse pointer changes to hand, click to display the help text for that field. Click again to make the pop-up text disappear.

OK

The 'OK' button closes the dialog box and accepts the choices that you have made.

Options

If the 'Mouse Trails' button is selected, mouse trails will immediately be enabled for display devices that support them. This is exactly the same as selecting them from the Mouse section of the Control Panel.

The 'Change Res' and 'Panning/Scrolling' buttons modify the behavior of the Windows driver.

Warning:	'Change Res' and 'Panning/Scrolling' have no effect on far-east Windows. That means Windows always restarts after a selection is made.

'Change Res.' makes Windows always run at the exact resolution of the flat panel when in 'Panel' or 'CRT/Panel' modes. When in CRT only mode, Windows will run at the resolution selected in the main screen of WinMode. If only the resolution and display type (with the exception of TV) are modified while 'ChangeRes' is selected, the changes will be made without restarting Windows.

Panning/Scrolling' makes Windows run at the resolution requested in the main screen of WinMode on all displays except the TV. If the selected resolution is higher then what the panel can display, Windows will use a virtual display while in 'Panel' or 'CRT/Panel' modes. This means that the actual display will be the resolution of the panel, but when you move the mouse to an edge of the screen, the display will either scroll (up or down) or pan (side to side).

This gives access to the entire high resolution desktop. Windows always needs to be restarted for changes to take effect when 'Panning/Scrolling' is selected.

TV Timings

This section is shown only when you have TV support and is active only when television is the current display output. Choose a timing that gives you the best picture on your TV.

6.4 VGA Display Drivers

Display drivers

The CIRRUS LOGIC video controller is VGA compatible. The display drivers described in this manual are supplied to improve the resolution for each supported software application package.

The VGA controller can support improved text resolution, providing greater readability when using the supplied drivers in text-based word processing programs. It also supports higher graphics resolutions, providing greater detail when using the supplied drivers in graphics-based programs.

In each application section, there will be a brief introduction describing the application and the revision level of the application supported by the supplied display drivers.

The installation instructions for each display driver will follow the introduction section. Follow the instructions carefully to be sure that each display driver is correctly installed. All of the installation instructions assume that the CIRRUS LOGIC drivers diskette is located in drive A:. If drive B: is used, the instructions should be changed appropriately.

The installation utility (INSTALL.EXE) should be used to copy display drivers directly to the appropriate application directories where they may be configured by the application software .

Before you begin

Make sure you know the version of the application for which you are installing drivers. The *CIRRUS 7543 diskette* contains drivers for several versions of certain applications. For your driver to operate properly, you must install the driver for your version of the application program.

It is assumed that the user is familiar with DOS and certain DOS commands. Please review the installation instructions and the associated DOS commands before attempting the actual installation.

Not all video modes will be available on all systems. If an extended mode driver is installed for a video mode that is not available, the application program will not function properly. There are a number of things that determine the list of available video modes. Some of these include the current monitor type, the amount of installed memory, and the revision of the VGA controller. To determine which modes are available before beginning the driver installation, it is recommended that the user run the CLMode program and examine the list of available video modes.

Microsoft Windows

Windows 3.1 installation

The Windows 3.1 driver installation utility copies all of the graphics driver and utility files to your hard disk. It also allows you to configure your graphics system for Windows 3.1 in either DOS or OS/2 v2.1. You can change the monitor refresh rates, resolution, number of available colors, large or normal size fonts and font cache size.

After new options have been selected, you can either immediately restart Windows, in which case the new configuration will take effect immediately, or you can continue working in the current resolution, in which case the new resolution will take effect the next time Windows is started. In some configurations the AUTOEXEC.BAT file needs to be modified to make the changes permanent.

Using Install

To run the installation program, start Windows 3.1. Insert the floppy labeled 'Windows 3.1 Display Drivers and Utilities Disk 1' into your floppy disk drive. From the Windows Program Manager select Run from the File menu. Type the letter of the floppy drive that the driver

diskette is in, followed by the word install. For instance, if the driver disk is in drive A:, type A: \INSTALL.EXE. Click on the OK button.

In the first dialog box that is displayed, you can set the path where you would like the utility programs to be installed. If you want to use the default directory, click on Continue. To change to another directory, you can either type the path name or you can click on the down arrow and select a directory for installation. The drop down box works just like the Directory field in a file open dialog box. After you select the directory, press the Continue button.

After the drivers have been copied to your hard disk, the install program will execute the WinMode utility. WinMode initially comes up in English. If you want different language support, install Windows driver disk 2. See the section of this manual documenting WinMode for complete instructions on using this program.

Reconfiguring Windows 3.1

If you are in Windows, run WinMode to reconfigure the Windows 3.1 drivers. Please refer to the Utility software section for information on WinMode. If you are in DOS, proceed as follows to reconfigure the Windows 3.1 drivers.

1. Insure that Windows 3.1 and the extended resolution drivers are already installed on your computer.
2. From your Windows directory, at the DOS prompt, type SETUP [Enter] to run the Windows SETUP.EXE program. Follow the instructions on the screen. When you come to the screen which lists the hardware and software components such as display adapter (e.g. VGA, CGA, etc.), keyboard type, mouse type, etc., go to the Display selection by using cursor keys to move the highlighted bar and press [Enter] .
3. You will see the list of drivers and their associated resolutions, such as:

   CIRRUS LOGIC 7543 v1.2, 1280x1024x256

CIRRUS LOGIC 7543 v1.2, 1024x768x256
CIRRUS LOGIC 7543 v1.2, 1024x768x64K
CIRRUS LOGIC 7543 v1.2, 640x480x256
CIRRUS LOGIC 7543 v1.2, 640x480x64K
CIRRUS LOGIC 7543 v1.2, 800x600x64K
CIRRUS LOGIC 7543 v1.2, 800x600x256

4. Highlight the desired choice by moving the cursor to the correct display driver, and then press [Enter] .
5. Setup will prompt you that the driver is already in your Windows directory and give you a chance to replace it. Use the existing driver.
6. Continue with the remainder of the setup procedure.

6.5 Installing the CD-ROM Driver

First-time Installation:

1. Start Windows 3.1 or higher.
2. In Program Manager, choose **Run** from the File menu.
3. Place *TEAC CD-ROM Installation Disk* in a floppy drive. In the Run dialog box, type the letter of the drive and **setup** (for example **A:\setup**), then click the OK button. Follow the instructions given to you.

6.6 Installing the ESS Sound Drivers

First-time Installation:

1. Start Windows 3.1 or higher.
2. In Program Manager, choose **Run** from the File menu.
3. Place *ESS sound Driver & Utilities Disk 1* in a floppy drive. In the Run dialog box, type the letter of the drive and **setup** (for example A:\setup), then click the OK button. The first *audio* Drive Setup window appears.

After installation, the application icons appear in the Audio Application program group.

Note:	If you have a previous version of the software and the Setup program is unable to load the driver, follow the procedure:

1. Exit Windows and reboot your system.
2. Delete AUDDRIVE.DRV, VAUDDRV.386, and THREED.VBX from the directory **windows\system**, if any of these files are present.
3. Restart Windows, ignoring and Window error messages.
4. Insert Startup Disk 1 in a drive, then choose **Run** from the File menu, enter **A:\setup**, and click the OK button.
5. Go through the Setup program again.

The Audio Recorder

The Audio Recorder enables you to record, compress, store, and playback voice, music, and other sound. It provides settings for sound attributes such as mono\stereo, compression level and sampling rate. You can use it to embed sound objects in documents

created in applications that support object linking and embedding (OLE). The Audio Recorder's record, edit, and playback capabilities are compatible with the Windows Sound Recorder and other recorders that record and playback in the PCM format.

The Audio Recorder can record to and playback from both .WAV and .AUD formats. .WAV is the Microsoft Windows 3.1 audio file format. The .AUD format uses ESPCM/ADPCM compression to produce an audio file. The Audio Recorder provides a choice of linear PCM, ADPCM and low, medium and high EPSCM compression

Starting the Audio Recorder

To start the Audio Recorder, open the Audio Applications program group and double-click the Audio Recorder icon.

OR

Choose **Run** from the Program Manager's File menu, then type C:\pcaudio\audiorec and click the **OK** button.

The Audio Recorder can receive input from microphones, a cassette tape player, a compact disk player, or any other line-in source.

Areas under the button bar show the length of a selected part of the current audio file, the total time, mono or stereo, and the sampling rate in kilohertz.

The large area in the center of the window shows the waveform of the current audio file.

The buttons at the bottom of the Audio Recorder window enable you to start and stop recording and playback.

Recording Control

The Recording Control enables you to regulate the recording level and stereo balance at which sound is recorded from multiple source. You use the Recording Control with the Audio Recorder or Extended Recorder during recording.

Volume Control

The Volume Control enables you to regulate the volume and stereo balance at which sound is played. You can use the Volume Control with the Audio Recorder during playback. If you are playing multiple sources, you can use the Mixer to combine them, with the Volume Control as a master regulator.

Mixer

The Mixer enables you to combine signals from several audio sources during playback, with control over the volume and stereo balance of each source.

When you use the Audio Recorder to play an audio file, you can open the Mixer to combine the audio from the file with audio from other sources.

The Volume Control is a natural companion the Mixer. The Volume Control acts as a master regulator of the combined signal from the Mixer.

Extended Recorder

The Extended Recorder is designed as tool for recording meetings, conversations, and dictation. Like the Audio Recorder, the Extended Recorder records, compresses, stores, and plays voice , music, and other sound. Unlike the Audio Recorder the Extended Recorder compresses and stores the audio file directly to your hard disk, using on-chip ESPCM compression. The recording time is limited only by the amount of hard disk space you have available.

The Extended Recorder can record to and playback from both PCM and . AUD formats. PCM is the Microsoft Windows 3.1 audio file format. The .AUD format uses WPSCM compression to produce an audio file. The Extended Recorder provides a choice of linear PCM (8 or 16 bits) or ESPCM low (4 bits) compression.

Audio Chip Library

From the Audio Clip Library you can select and play audio files stored under three headings (or folders): music, phrases, and sounds. You can also add folders and audio files of your own to the Audio Clip Library.

You can play any audio file in the library by using the Audio Recorder (opened automatically by the Audio Clip Library) the Microsoft Sound Recorder, or other recorders compatible with the Windows .WAV format.

Audio Clip Library folders are stored in the directory PCAUDIO under the subdirectory AUDCLIPS.

Audio Reminder

The Audio Reminder has two alarms, each with a separate time, sound, and snooze settings. Once you set the alarms, they will go off on schedule every day as long as the Audio Reminder window is open or minimized to an icon.

Stopwatch

The Stopwatch keeps track of the time elapsed since it was started. You can set the Stopwatch to sound a tick each second it is running and announce the amount of time elapsed since it was activated.

Timer

The Timer works the opposite of the Stopwatch. The timer counts down from the time you set to 00:00. Whenever you stop the Timer, it announces that amount of time remaining. The Timer sounds a bell each second it is running. From 19 seconds on down, the Timer announces each second. You can also set the Timer to announce each minute as it passes.

7 Using PHDISK.EXE

PHDISK.EXE is the utility program you use to prepare your hard disk for the Suspend to Disk function. It can be used to prepare either a dedicated partition or a DOS-based hidden file prior to storing system configuration data, and system and video memory.

7.1 Command Line Options

The following table list the PHDISK command line options and additional parameters. The PHDISK options can be called using only the first letter of each option and parameter. For instance, either PHDISK /REFORMAT or PHDISK /R will invoke the reformat option.

Option	Parameters	Description
none		Displays the PHDISK Opening Screen.
/CREATE	/PARTITION	Format the Save to Disk partition.
	/FILE	Add space to the Save to Disk partition.
/DELETE	/PARTITION	Delete all Save to Disk partitions.
	/FILE	Delete the space added to the Save to Disk partition added by /CREATE /FILE.
/INFO		Displays data about the Save to Disk partition or file.
/REFORMAT	/PARTITION	Reformats the Save to Disk partition after an error is detected.

Below is an example of the kind of information that is displayed when PHDISK is called without a command line option. This example displays both the Save to Disk FILE INFORMATION and Save to Disk PARTITION INFORMATION headers. These headers

are displayed only when both a Save to Disk partition and a Save to Disk file exist.

The USAGE and OPTIONS headers are displayed in several screens displayed by PHDISK.

```
PHDISK 2.2 -- Phoenix NoteBIOS 4.0 (TM) Save to Disk Preparation Utility
Copyright (c) Phoenix Technologies Ltd. 1995  All rights Reserved.

Save to Disk file information:
   Partition starts at sector xxxxxx (head xx, cylinder xx, sector xx)
   Partition size: xxxx KBytes total

Current System Status:
   You currently need a Save to Disk area of xxxx KBytes.  PhDisk will
   also require additional overhead and will automatically calculate the
   actual required space.

You have both a file and a partition. Save to Disk will default
to file. Either delete the file, or the partition.

Usage: PHDISK [options]
/CREATE   (/FILE or /PARTITION)     -- Create STD file or partition
/DELETE   (/FILE or /PARTITION)     -- Delete existing STD file or partition.
/INFO                               -- Information on STD disk area(s)
/REFORMAT /PARTITION                -- Reformat existing STD partition

This utility configures a hard disk to utilize the Phoenix NoteBIOS 4.0
Save to Disk feature. Please refer to your user manual for information
regarding Save to Disk.
```

CREATE Option

The CREATE option measures the amount of on-board memory, and partitions a segment of the hard disk drive large enough to store all the data that might be there. The CREATE option formats the Save to Disk partition or file, marking bad spots on the hard disk drive as they are found.

Automatic Memory Size Calculation

PHDISK automatically measures all system and video memory and calculates the exact amount of hard disk space required to store the maximum amount of data the memory might contain. The result of this measurement, [SIZE], is displayed on the PHDISK screen.

The total amount of system and video memory is calculated by one of the following formulas:

- If the video BIOS is VESA compatible:
  - calculated memory = physical system memory + 0.3 kbytes (Save to Disk overhead)
- If the system does NOT contain a VESA video controller:
  - calculated memory = physical system memory +
  - 2 Mbytes (maximum video memory required) + 0.3 kbytes (Save to Disk overhead)

User-Specified Memory Size

The user may specify a certain amount of memory to be allocated for the Save to Disk function. However, the amount of space required to store all system and video memory is calculated automatically, whenever the CREATE option is used, even if the user specifies some desired amount.

If the amount specified by the user is equal to or greater than the calculated amount, then the user-specified amount is allocated. If the user-specified amount is less than the calculated amount, then no space is allocated, and an error message is displayed.

If you wish to allocate a specific amount of disk space for this function, enter the amount in kilobytes, as a simple decimal number, *without* any notation such as *K* or *KB*.

/PARTITION or /P

PARTITION creates a hard disk partition where only Save to Disk data can be stored.

/FILE or /F

FILE creates a file on the hard disk DOS partition that is used to store only Save to Disk data.

When the system and video memory outgrows the size of this Save to Disk space, the /FILE option can be used to re-allocate a new Save

to Disk partition, and also eliminates the time consuming task of backing up the entire hard disk drive before running PHDISK /CREATE /PARTITION. The Save to Disk file can be a temporary or a permanent solution.

After the Save to Disk file is created, use PHDISK /DELETE /PARTITION to keep Save to Disk from writing data there, instead of writing to the file. Save to Disk may not differentiate between the Save to Disk partition and the Save to Disk file until the partition is deleted.

/CREATE Option Syntax

The syntax of the PHDISK /CREATE option is:

PHDISK /CREATE [SIZE] [/FILE][/PARTITION]

The table below shows the various ways to use the /CREATE option:

Command	Description
PHDISK /CREATE /FILE PHDISK /C /F	Supplements an existing Save to Disk file-space (adds the amount of additional memory required as calculated by PHDISK).
PHDISK /CREATE /PARTITION PHDISK /C /P	Creates a Save to Disk partition using the amount of memory required as calculated automatically by PHDISK.
PHDISK /CREATE 10240 /FILE PHDISK /C 10240 /F	Creates a 10 megabyte Save to Disk file.

REFORMAT Option

The /REFORMAT option resets the pointers in a Save to Disk partition. This option should be used after a Save to Disk operation is terminated by a read or write error.

Note: Only Save to Disk partitions can be reformatted; Save to Disk files can not. If a formatting error occurs while writing to a Save to Disk file, use the PHDISK /CREATE /FILE /DELETE options to reformat the Save to Disk file.

/REFORMAT Option Syntax

Command	Description
PHDISK /REFORMAT /PARTITION PHDISK /R /P	Reformats the Save to Disk partition.

DELETE Option

When DELETE is specified, the pointers and data in the specified Save to Disk area (file or partition) are deleted. Use DELETE when bad data are displayed after a Resume from Disk operation.

Note: DELETE erases the data in the Save to Disk space. To actually remove the Save to Disk area, use the DOS FORMAT command.

DELETE Option Syntax

Command	Description
PHDISK /DELETE /FILE PHDISK /D /F	Deletes the contents of the Save to Disk file.
PHDISK /DELETE /PARTITION PHDISK /D /P	Deletes the contents of the Save to Disk partition.

INFO Option

The /INFO option displays data about the Save to Disk partition or file.

INFO Option Syntax

Command	Description
PHDISK /INFO /FILE PHDISK /I /F	Displays the size (in kilobytes) of the Save to Disk file.
PHDISK /INFO /PARTITION PHDISK /I /P	Displays the size (in kilobytes) and location of the Save to Disk partition.

Below is an example of the output of the /INFO option when a Save to Disk partition exists on the system:

```
PHDISK 2.2 - Phoenix NoteBIOS 4.0 ™ Save to Disk Preparation Utility
Copyright © Phoenix Technologies Ltd. 1995 All Rights Reserved.
Save to Disk File Information:
        Partition starts at sector XXXXXX (head xx, cylinder xx, sector xx)
        Partition size: xxx KBytes total
Current System Status
You currently need a Save to Disk area of xxxx KBytes. PhDisk will also
require additional overhead and will automatically calculate the actual
required space.
```

Messages

PHDISK returns various informational messages, not all of which are listed here. The following list emphasizes the error messages, including a possible course of action should one of them appear.

PHDISK Sign-on Message

```
PHDISK 2.2 -- Phoenix NoteBIOS 4.0 (TM) Save to Disk Preparation Utility
Copyright (c) Phoenix Technologies Ltd. 1995  All rights Reserved.
```

Help Screen

The HELP screen is displayed when PHDISK is called without any command-line options. The following text is displayed when a Save to Disk space already exists:

```
Usage: PHDISK [options]
/CREATE (/FILE or /PARTITION)    --  Create STD file or partition
```

```
/DELETE (/FILE or /PARTITION)   --  Delete existing STD file or partition
/INFO                           --  Information on STD disk area(s)
/REFORMAT /PARTITION            --  Reformat existing STD partition
This utility configures a hard disk to utilize the Phoenix NoteBIOS 4.0 Save
to Disk feature. Please refer to your user manual for information regarding
Save to Disk.
```

Unrecognized Option

The following text is displayed when an invalid option or parameter is entered on the command line:

```
Error: (User option) is an unrecognized command line option.
For a command line summare, invoke PHDISK without any parameters
```

Fatal Error

The following text is displayed when a hard disk error is detected during any Save to Disk operation. (Don't panic! The word *fatal* simply means that the program was terminated, not that your hard disk is trashed.)

```
Error: A fatal hard disk error has occurred.
Check your hardware configuration and re-execute PHDISK
```

Run a hard disk utility program to determine the source of the error, then run PHDISK again.

Not Enough Disk Space

The following text is displayed when the amount of unused disk space available is less than the amount required to create the Save to Disk partition.

```
Error: Not enough free disk space exists to create the
suspend to disk partition. Refer to the user manual for
```

```
possible suggestions on increasing the among of free disk
space for the suspend to disk partition.
```

Delete unused files, backup the DOS partition, reformat the disk, then run PHDISK /PARTITION /CREATE to create a larger partition.

Save to Disk Partition Exists

The following text is displayed when a PHDISK /CREATE /PARTITION operation is attempted while a Save to Disk partition exists.

```
Error: Phoenix NoteBIOS Save to Disk partition already
exists. To resize the partition, delete the existing
partition with PHDISK/DELETE and create the partition with
PHDISK/CREATE.
```

Re-allocate the Save to Disk partition, if needed; or do nothing.

Too Many Bad Sectors

The following text is displayed when the Save to Disk partition is too small because of an increasing number of bad sectors.

```
Error: Too many error exist in the Phoenix NoteBIOS (TM) Save
to Disk partition. Check your hardware configuration and
rerun PHDISK.
```

Execute PHDISK /CREATE /FILE to create a Save to Disk file.

First Two Sectors Bad

The following text is displayed when the Save to Disk partition cannot be used.

```
Error: The first two sectors in the Save to Disk partition
are both unusable. This disk is unsuitable for the Phoenix
NoteBIOS Save to Disk feature.
```

Execute PHDISK /PARTITION /DELETE, and PHDISK /PARTITION /REFORMAT.

PHDISK /CREATE Failed to Execute

The following text is displayed when no Save to Disk partition exists, or the partition table on head 0, cylinder 0, sector 1 is corrupted.

```
Error: The Phoenix NoteBIOS (TM) Save to Disk partition
doesn't exist or the hard disk partition table on head 0,
cylinder 0, sector 1 is corrupted. Invoke PHDISK/CREATE to
create the Save to Disk partition.
```

Execute PHDISK /PARTITION /CREATE.

Good Sector Map Corrupted

The following text is displayed when a Save to Disk partition exists, but the GSM is corrupted.

```
Error: The "good sector map" (GSM) in the Phoenix NoteBIOS
Save to Disk partition is bad. Invoke PHDISK /REFORMAT to
rebuild this table.
```

Execute PHDISK /PARTITION /REFORMAT to reset the GSM flags.

Not Enough System Memory

The following text is displayed when not enough system memory is available to run PHDISK.

```
Error: Couldn't allocate additional memory required to
execute PHDISK.
```

Add more system memory, then attempt to try the PHDISK command again.

File Already Exists

The following text is displayed when the PHDISK /FILE /CREATE command is entered, and a Save to Disk file already exists.

Using PHDISK.EXE

```
Phoenix NoteBIOS 4.0 (tm) Save to Disk Preparation Utility
Copyright (c) Phoenix Technologies Ltd. 1995  All rights Reserved.

Save to Disk file information:
   Partition starts at sector xxxxx (head xx, cylinder xx, sector xx
   Partition size: xxxx KBytes total

Current System Status:
   Your Save to Disk file is named C:\SAVE2DSK.BIN and has a size
   of xxxx KBytes. It has System, Hidden, and Read Only attributes.

The system will now be reset to allow the BIOS to
recognize the cahnges. If the System fails to reboot,
please reset the System manually.

Press any key to reset the system ...
```

Delete the current file, using PHDISK /FILE /DELETE, before creating another Save to Disk file.

8 Caring for Your Computer

This chapter provides you with information on how to keep your computer in top working condition.

8.1 Preventing Problems

Your notebook computer requires little physical maintenance. But as with any piece of electrical equipment, there are a few simple checks and precautions that will help assure that your computer provides outstanding performance for many years.

- Clean your computer occasionally.
- Unplug the computer from the wall outlet and remove the battery pack before cleaning. Use a damp cloth to clean your computer. Avoid using spray cleaners and any kind of alcohol or other inflammable solvents.
- Do not block the air flow around the computer. Maintain a distance of four inches (10 cm) between the computer and obstructions.
- Check the cable and power connectors periodically.
- Keep your computer away from excessive humidity, direct sunlight, high temperatures, and extreme cold.
- Do not smoke near your computer.
- Do not eat near or place liquids near your computer.
- Avoid dusty environments, as dust can cause damage to disks and disk drives.
- Never subject your computer to sudden shocks or extreme vibration. Do not drop it or hit it with other equipment.

- If you suddenly move your computer from a cold place to a warm place, undesirable moisture may condense inside the unit. After sudden temperature changes, let the computer come to room temperature before using it. This allows any moisture inside the computer to evaporate.

8.2 Traveling with Your Notebook Computer

For safety, security, and convenience when traveling with your computer, follow these guidelines:

- Before traveling, save your data by backing it up onto floppy disks.
- Take along an extra backup copy of your data.
- Do not travel with a disk in the floppy disk drive.
- Do not travel with the computer on. This may result in loss of data and/or damage to the hard disk drive.

Warning: Do not transport the computer while it is turned on.

- Before traveling, disconnect the AC adapter from the computer.
- Always carry either a spare, fully charged battery pack or the AC adapter.
- When carrying the computer, take care not to bump it into things. The computer cannot take the kind of treatment that you might give a briefcase.
- Whenever possible, hand-carry the computer in its carrying case.

If you must ship your computer as freight or baggage, pack it carefully. Use the original cartons and foam cushions, if possible. If they are not available, use sturdy cartons and cushion the computer well on all sides.

8.3 Batteries & Battery Discharge

It is a good idea to occasionally discharge the battery pack fully to preserve its operating performance. Repeatedly recharging the battery pack when it has not discharged completely can decrease the capacity of the battery pack. In the battery pack there is a GAS-GAUGE IC to record the charge/discharge status of the battery.

In order to get the most out of the battery pack, we recommend that you attempt to use up the battery power completely before recharging. Then recharge the battery from empty to full.

You can also extend the life of the battery pack by using the computer's power-saving features.

To fully discharge and recharge the battery pack:

1. Disconnect the AC adapter from the external power source, then from the computer.
2. Turn on the computer.
3. Ignore the power failure signals (i.e. battery warning beeps).
4. When the battery is fully discharged (that is, when the computer goes off), attach an external power source and fully recharge the battery

An incorrect report of the battery status may be shown due to lost data of the GAS-GAUGE IC caused by battery over-discharge. One reason for the battery to over-discharge may be that the battery has not been charged for a long time. If this is the case, a learning cycle is recommended to correct this problem.

The learning cycle is listed as follows:

1. Turn off the notebook and use the AC adapter to charge the computer's battery pack to full. The battery icon on the indicator panel shows the charge of the battery.
2. To fully discharge and recharge the battery pack, follow the four steps listed below:
   a. Disconnect the AC adapter from the external power source, then from the computer.
   b. Turn on the computer and disable the POWER SAVING feature.
   c. Ignore the battery low warning signals.
   d. When the battery is fully discharged (that is, when the computer goes off), attach an external power source and fully recharge the battery.

4. Check the battery status again. If the battery pack gets to 100% capacity then the learning cycle is done. Otherwise repeat the learning cycle mentioned above again. If after you try the second time and still fail to get the battery pack to 100% capacity, contact your dealer.

8.4 Taking Care of the LCD Screen

You can extend the life of the LCD screen by caring for the screen as follows:

- Avoid scratching the surface of the screen. The front polarizer is easily damaged.
- Use a soft, lint-free cloth for cleaning the LCD screen.
- Do not allow water droplets to remain on the screen. Water can cause permanent staining.
- Do not expose the LCD screen to bright sunlight or ultra-violet radiation.
- Do not expose the LCD screen to extreme temperatures. Freezing and liquefaction of the liquid crystals may result in damage to the display.

9 Troubleshooting

This chapter describes locating and solving problems that you may encounter while using your computer.

9.1 Locating a Problem

Problems with your computer can be caused by something as minor as an unplugged power cord – or as major as a damaged hard disk. The information in this chapter is designed to help you find and solve minor problems. If you try all the suggested solutions and you still have a problem make a list of what steps you have taken to correct the problem and contact your dealer.

Successful troubleshooting is the result of careful observation, deductive reasoning, and an organized approach to solving the problem.

The problems that you will encounter can be divided into two basic categories: hardware problems and software problems. Hardware problems can be further divided into electrical and mechanical problems. You will know you have a hardware problem if the screen is dark, the computer cannot read the disk drives, or you get an error message during the Power-On Self Test (POST).

Software errors can occur at several levels. The ROM BIOS and the operating system can give you a large number of error messages. And on top of this, each application software package has its own set of error messages. It is important to determine whether the software error message you are getting is from the application or the operating system. Once you know this, you can look in the respective manual for a solution to the problem.

9.2 Checking the Power Cables, and Connections

Start by performing a careful visual inspection of the exterior of the computer. If no lights are displayed, make sure that your computer and its peripherals are getting power and communicating with each other properly.

To check the power cables, and connections:

1. If you have been using battery power, connect the computer to an external power source and make sure that the battery has a charge.
2. If you are using the computer with the AC adapter, check the power outlet, the power cord, and any power switches that may affect your computer:
   - Check the wall outlet or power strip with an item that you know is functioning properly. A lamp or radio is a convenient item for checking the power. You may also need to check the fuses and breakers in your electric box.
   - If the outlet is controlled by a wall switch, make sure that the switch is on.
   - If the outlet is controlled by a dimmer switch, use a different outlet.
   - If your computer is plugged into a power strip with an on/off switch, make sure the switch is on.
3. With the computer's power switched off, check all cable connections. If the computer is connected to any peripheral devices, look for loose or disconnected cables.

   If the computer is too close to a wall, a cable connection may be loose or the cables may be crimped.

Note:	Do not substitute cables for different type of devices even if they look exactly alike. The wiring inside the cable may be different.

4. When you are certain that you have power available and all connections are good, turn the computer on again.

   If the computer still does not start, you may have a hardware problem.

9.3 About the Power-On Self Test

The Power-On Self Test (POST) runs every time you turn on or reset the computer. The POST checks memory, the main system board, the display, the keyboard, the disk drives, and other installed options.

A few seconds after you turn on your computer, a copyright message appears on your display screen. A memory test message appears next; as the test continues, memory size increases until all installed memory is tested. Normally, the only test routine visible on the screen will be the memory test.

Two classifications of malfunctions can be detected during the POST:

- Error messages that indicate a failure with either the hardware, the software, or the *Basic Input/Output System* (BIOS). These *critical malfunctions* prevent the computer from operating at all or could cause incorrect and apparent results. An example of a critical error is microprocessor malfunction.

- Information messages that furnish important information on the power-on and boot processes such as memory status. These *non-critical malfunctions* are those that cause incorrect results that may not be readily apparent. An example of a non-critical error would be a memory chip failure.

In general, if the POST detects a system board failure (a critical error), the computer halts and generates a series of beeps. If failure is detected in an area other than the system board (such as the display, keyboard, or an adapter card) an error message is displayed on the screen and testing is stopped. It is important to remember that the POST does not test all areas of the computer, but only those that allow it to be operational enough to run any diagnostic program.

If your system does not successfully complete the POST, but displays a blank screen, emits a series of beeps, or displays an error code, consult your dealer.

9.4 General Hardware Problems

A few common hardware problems and suggested solutions are presented in the table below:

Table 5. General problems.

Problem	Solution
The display screen is dark.	• Make sure that the computer is not in Suspend mode. • Check the Brightness and Contrast controls for the screen. If the controls are turned too far down, the screen will be dark.
An incorrect date and time are displayed.	Correct the date and time using the DOS DATE and TIME commands or the options in the Setup Utility. If the date and time are still incorrect, contact your dealer to change the system board battery.

Problem	Solution
The message "Non-system disk or disk error, Replace and strike any key when ready" appears during boot.	You have inserted a non-bootable disk (either a defective disk or one without an operating system). Replace the disk with a bootable disk.
You hear irregular beep sounds and the computer halts operation.	Contact your dealer.
An unidentified message is displayed.	Reboot the computer, run System Setup, and confirm the setup parameters. If the same message is displayed after starting up again, contact your dealer.
You can't read anything from the CD-ROM drive.	• Check that the CD is properly placed in the drive. • Check that you are using the proper program with that type of CD.
You cannot operate the printer.	• Check the cable connection to the printer. • Check that the power switch of the printer is turned on. • Confirm that the printer is on-line.
You can't save anything to disk.	There are several conditions that might cause this problem: • The disk has not been formatted. See your operating system manual for information on formatting floppy disks. • The disk is write-protected. Eject the disk, remove the write-protection, and reinsert the disk. • The disk is full. You can try using another disk or you can remove items from the disk to free up more space. • The disk drive is not working. If you've tried the suggestions above and still have trouble saving anything, take the computer to your dealer for help.

Problem	Solution
You cannot operate the mouse.	• Check the cable connection. • Try using the mouse with another application to see if there is a compatibility problem between the software and the mouse.

9.5 Contacting Your Dealer

If you still have a problem after reading the preceding sections, the next step is to contact your dealer. He can determine if the problem is something that requires the computer to be taken to the shop. Before you call your dealer, however, prepare the following information:

- How is your computer configured? Your dealer needs to know what peripheral devices you are using.
- What messages, if any, are on the screen?
- What software were you running at the time?
- What have you done already to try to solve the problem? If you have overlooked a step, your dealer may be able to solve the problem over the phone.

Appendix A: Hard Disk Drive Types

The system BIOS supports 39 pre-defined drive types. Below is a table of the pre-defined drive types and their default values.

End users can modify the user-defined drive type for each fixed disk listed in Setup by using menus Setup menu system. This feature avoids the need for customized software for non-standard drives.

Type	Cylinders	Heads	Sectors	Wrt Pre	LZone
1	306	4	17	128	305
2	615	4	17	300	615
3	615	6	17	300	615
4	940	4	17	512	940
5	940	6	17	512	940
6	615	4	17	-1	615
7	462	8	17	256	511
8	733	5	17	-1	733
9	900	15	17	-1	901
10	820	3	17	-1	820
11	855	5	17	-1	855
12	855	7	17	-1	855
13	306	8	17	128	319
14	733	7	17	-1	733
15	Reserved	--	--	--	--
16	612	4	17	0	633
17	977	5	17	300	977
18	977	7	17	-1	977
19	1024	7	17	512	1023
20	733	5	17	300	732
21	733	7	17	300	732
22	733	5	17	300	733
23	306	4	17	0	336
24	612	4	17	305	663

Appendix A

Type	Cylinders	Heads	Sectors	Wrt Pre	LZone
25	612	2	17	300	612
26	614	4	17	-1	614
27	820	6	17	-1	820
28	977	5	17	-1	977
29	1218	15	36	-1	1218
30	1224	15	17	-1	1224
31	823	10	17	512	823
32	809	6	17	128	809
33	830	7	17	-1	830
34	830	10	17	-1	830
35	1024	5	17	-1	1024
36	1024	8	17	-1	1024
37	615	8	17	128	615
38	1024	8	17	-1	1024
39	925	9	17	-1	925

Appendix B: Specifications

This appendix lists the system specifications, including general, mass storage, video system, TouchPad, electrical, mechanical, operating environment, and software specifications. It also presents specifications for system options.

General

CPU:	Intel P54C, Intel P54CSLM, Intel P54LM
Core Logic Chips:	Opti Viper
I/O Chip:	SMC 665 - IR
System ROM:	150ns, 128/256 KB Flash ROM
System DRAM:	70ns, 8MB standard; 40MB maximum
PCMCIA Sockets:	• Two PCMCIA type II connectors or one PCMCIA type III and one type II connector. • Full ExCA implementation of PCMCIA 2.1/JEIDA 4.1 standard. • Support for the memory-saving execute-in-place standard (XIP).
Keyboard:	Sunrex (86 keys)
Sound Chip:	ESS 1788
Keyboard Controller:	Mitsubishi M38802

I/O Ports:	• Serial Port (1), 16550 UART RS-232 9-pin male connector • Parallel Port (1), EPP/ECP 25-pin female connector • External Keyboard Connector (1), 6-pin mini-DIN • VGA/SVGA Connector (1), 15-pin female • Docking Port (1), 300 pin female • Composite video output port (1) • MIDI/GAME port
System Status Icons:	• AC Power • Battery • Num Lock • Caps Lock • Scroll Lock • Pad Lock • HDD • FDD • CD-ROM • PCMCIA • Suspend
TouchPad:	PS/2 type
Battery:	NiMH 3000mAh x 10 Lithium Ion 3900mAh x 9

Mass Storage

Hard Disk Drive

Standard Capacity:	540MB
Optional Capacity:	720MB, 1.2GB
Type:	2.5" (MCC Specification)
Height:	19.05 mm (.762") or lower

Floppy Disk Drive

Media Type/Capacity:	3.5", 1.44MB
Height:	12.7 mm (.508")

Video System

Display:	DSTN color LCD TFT color LCD
Video Controller:	Cirrus Logic 7543
Video Standard:	VGA/SVGA
Data Path:	PCI Local Bus
Resolutions & No. of Colors:	LCD: 800x600, 256 colors CRT: 1024x768, 256 colors
Video DRAM Standard:	70ns, 1MB
Video DRAM Optional:	70ns, 1MB
LCD screen:	Color DSTN: 11.3" (287mm) Color TFT: 11.3", 12.1" (287mm, 307mm)
LCD resolution:	800x600

TouchPad

Area:	46 mm x 63 mm (1.81" x 2.48")
Resolution:	250 ± 10% dpi
Number of buttons:	2

Electrical

AC Adapter:	Input --	100 ~ 240 VAC ± 10%
	Output --	19V±1V with 1.8A current limit
		Power 34 W Maximum
		Frequency 47 Hz, 63 Hz
DC/DC Converter (on board):	Input --	9 ~ 20V (battery or adapter)
	Output --	+5V (5V± 5% 0 ~ 3A)
		+2.5V (2.5V± 5% 0 ~ 3A)
		Optional:
		+2.9V (2.9V± 5% 0 ~ 3A)
		+3.1V (3.1V± 5% 0 ~ 3A)
		+3.3V (3.3V± 5% 0 ~ 3A)
		+3.3V (3.3V± 5% 0 ~ 3A)
		+12V (12V± 5% 0 ~ 150mA)

Inverter:	Input –	9 ~ 20V
	Output--	In accordance with the LCD spec. 1. VAA (+22 ~ 32V adjusted by function keys) 2. VAA (0.8 ~ 2.8V adjusted by function keys)
Phase:		Single, three-wire
Battery (NiMH):		Voltage: 12V/pack Recharge time: 130 mins. for NiMH 3000mAh Battery life: 2 hours
External Battery Charger:		Charge current: 2.2A Charge time: 3000mAh, 130 mins.
Battery (Lithium-ion):		Voltage: 10.8V/pack Recharge time: 210 mins. for Lithium Ion 3900 mAh Battery life: 2 hour s.
External Battery Charger:		Charge current: 2.2A Charge time: 3900mAh, 210 mins.

Mechanical

Size:	299mm (W) x 230mm (D) x 56mm (H) 11.8" (W) x 9" (D) x 2.2" (H)
Weight:	3.2 Kg (7 lbs.)

Operating Environment

Temperature:	System On:	5° to 35° C
	System Off:	-20° to 60° C
Humidity:	System On:	30% to 90% non-condensing
	System Off:	5% to 95% non-condensing
Altitude	System On:	-200 ~ 10000 ft. -61 ~ 3048 m
	System Off:	-200 ~ 30000 ft. -61 ~ 9144 m

Software Specifications

System Software

System BIOS:	Phoenix
Video BIOS:	Cirrus Logic
Supported Operating Systems:	DOS, Windows, OS/2, SCO Unix
Standard Software Drivers:	Pointing Device driver, VGA/SVGA drivers, PCMCIA driver, PMU driver, ESS Sound drivers

Power Management Modes

Normal Mode:	All clocks run at full speed; all peripheral devices have power.
Idle Mode:	The CPU clock and some other clocks have reduced frequency.
Standby Mode:	The CPU clock and some other clocks have reduced frequency; the video circuitry and the HDD are in low-power mode.
Suspend:	Most of the components in the system are off; the video circuitry is in low-power mode.

Options

RAM Modules:	4/8/16 MB

Docking Station:	Includes the following • Slots for PCI expansion cards • External keyboard connector • MIDI/GAME port • Serial ports (2) • Printer port (Centronics) • VGA/SVGA connector • AC IN connector • Power switch

Index

E

F

G

H

I

K

L

M

N

O

P

R

S

T

U

V

W

R0055123
Rev. 5